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NAVAL SUBMARINE MEDICAL RESEARCH LAB GROTON CONN

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LEADERSHIP-STYLE FLEXIBILITY, (U)

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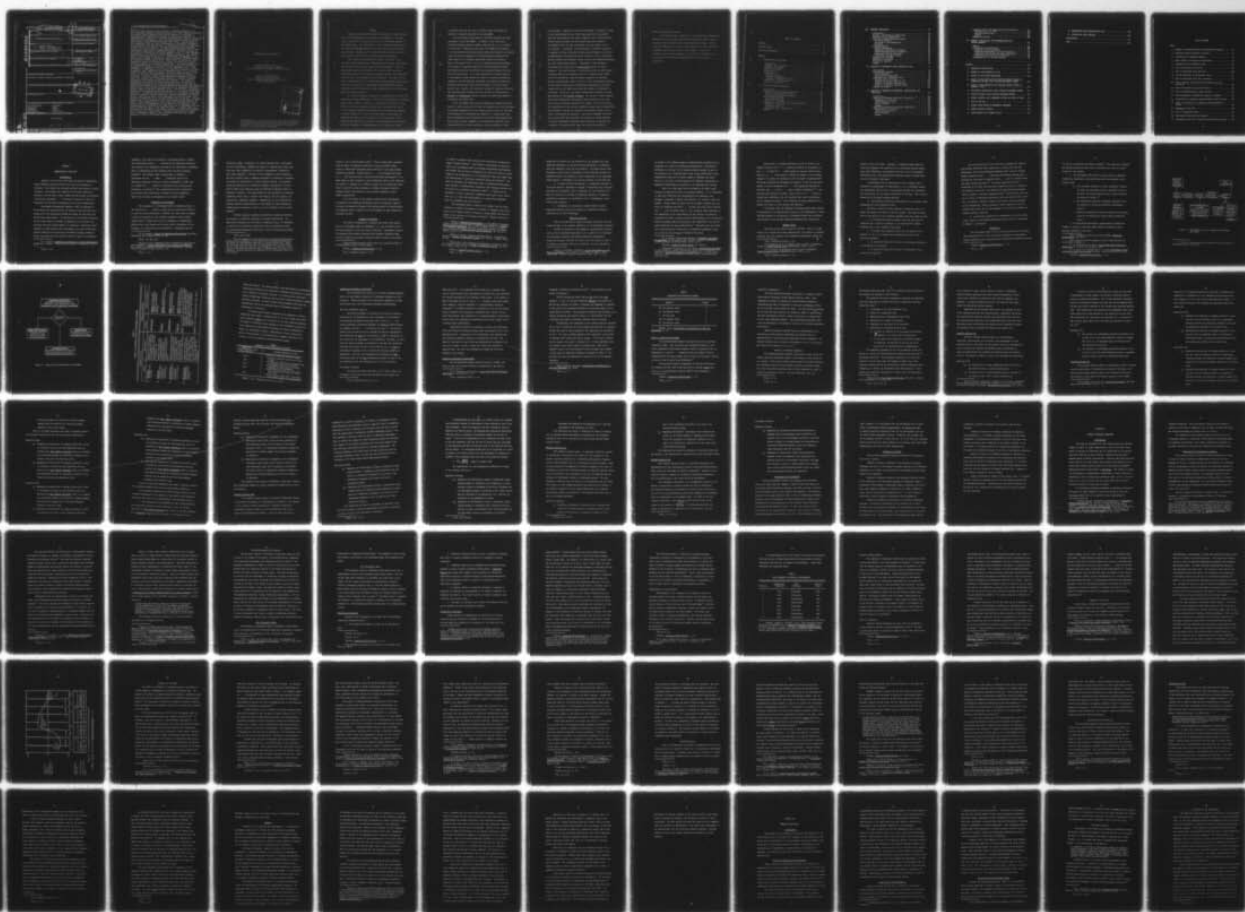
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)		REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER #852		2. GOVT ACCESSION NO.		3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) (6) LEADERSHIP-STYLE FLEXIBILITY		5. TYPE OF REPORT & PERIOD COVERED (14) NSMRL-852		6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) (10) Andrew J. Schou, D. B. A. Robert J. Biersner, Ph.D.		8. CONTRACT OR GRANT NUMBER(s)		9. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS - per DDC form 500	
10. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Submarine Medical Research Lab, Box 904 Naval Submarine Base, Groton, Conn. 06340		11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE May 1977	
13. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		14. NUMBER OF PAGES 233		15. SECURITY CLASS. (of this report) Unclassified	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
18. SUPPLEMENTARY NOTES		19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Job Satisfaction      Personnel Leadership              Rates Management            Skills Organization           Supervisors Performance (Human)		20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  (see reverse)  252 220	



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20. The stated purpose of this study was to determine whether or not:  
1) Subordinates perceived leaders altering style to meet different situations.  
2) leaders varied leadership style with the nature of the problem, 3) perceived style flexibility was related to performance evaluations of subordinates by superiors, 4) perceived flexibility was related to subordinates' satisfaction with superiors, and 5) perceived leadership style flexibility was related to Least-Preferred-Coworker (LPC) scores. Implementation of the methodology took the form of administering to two groups of managers a questionnaire that would provide: 1) Their perceptions of the leadership styles used by their superiors, 2) their satisfaction with leadership received, 3) their opinion of their Least-Preferred-Coworker, and 4) their performance evaluations of subordinate managers. The study was based on a group of 149 first-level and middle managers located at a Navy laboratory. Questionnaires were mailed to all 149 managerial personnel. The response rate on this mailing was 86 per cent. Non-response did not appear to be related to the types of information sought, but appeared to be due instead to vacations, illness, and so forth. Additionally, by employing a large sample and because of the high rate of return, the effects of any bias are small enough to be considered insignificant. The findings showed that a considerable degree of style flexibility was perceived by subordinate managers to be exercised by superiors at both managerial levels. Also, a majority of respondents did not perceive that their superiors, at either managerial level, treated problems as dichotomous pairs (i. e., used one style for simple problems and another style for complex problems, or that they used one style for interpersonal and another style for technical problems). From this finding it was inferred that subordinates did not feel that superiors had a "programmed response" to problems. Perceived leadership style flexibility was not found, however, to be related to performance evaluations of subordinates by superiors. The majority of respondents were also found to have satisfaction scores in the high and middle rating intervals; this indicated widespread satisfaction with superiors. This pattern of satisfaction was duplicated for all leadership flexibility styles except for the zero flexibility style. For this style, approximately one-half of the respondents indicated low levels of satisfaction with their superiors. In addition, perceived flexibility was not related to leadership style as measured by the LPC instrument. Very few respondents had low LPC scores, more than one-third of the respondents had high LPC scores, while nearly two-thirds were in the interval between high- and low-LPC. A possible explanation for the existence of this large middle LPC group might be that many of these managers were not solely task or relationship-oriented, but rather chose a style appropriate to the demands of the situation. This interpretation is confirmed by the large proportion of respondents with high style flexibility found in this middle LPC group. It appears that it is possible for both kinds of role behavior (high- and low-LPC) to be combined in the person of a single leader, a statement supported by the finding that a considerable degree of style flexibility was perceived at both managerial levels by subordinate managers.

LEADERSHIP STYLE-FLEXIBILITY\*

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## PREFACE

Strategic considerations dictate the deployment of Fleet Ballistic Missile (FBM) submarines; each submarine is an element in a strategic system, and each has a unique and vital role in the defense posture of the United States. The effectiveness of this strategic system requires that crews be programmed through a recurring cycle of being on-patrol and off-patrol. Exigencies of the service dictate both the work cycle and the overall life cycle of crew members and their families.

While on-patrol, the submarine's company constitutes a self-contained, semi-autonomous unit consisting of over 100 men; communication with the rest of the world is limited to inbound messages. There are organizational groupings (officers, CPO's, and so forth), and there are groupings such as those based on education, service school attendance, seniority, age, watch schedule, and duty specialty. The nature of the mission dictates the use of an authoritative (task-oriented) organizational structure in an artificial, constrained, highly-programmed, physical environment which also provides a stable, predictable social environment during the on-patrol period.

The off-patrol period, in contrast, is relatively less stable, less structured, and less predictable. During the off-patrol period, submarines undergo repair, refit, or retrofit. Crew members are required to spend many hours on board attending to duties such as qualifying in the use of newly installed equipment, undergoing formal training, and attending to medical matters, all of which are aimed toward assuring that the submarine (and crew) are fully prepared for the next patrol. This period becomes particularly stressful because dependents must reconcile the continued absence of husband/father after a long period at sea;



a situation which may well lead to conflict within the family and creation of emotional pressures on the crew-member.

The on-off patrol cycle serves to prescribe virtually the total environment of each crew member. It imposes a life cycle which alternates between simple and complex, high and low, (i. e. a variety of activities). During this life cycle, crew members are pressured to be task-oriented (by the work group) during both phases of the mission cycle; and they are pressured to be interpersonally-oriented by the family group (or its surrogate equivalent) during the off-patrol phase of the mission cycle. It is to be expected that some personnel are incapable of adapting themselves to such environmental changes, particularly when faced by conflicts and recurring pressures from the work and family groups. It is also expected that the great majority of crew members, having survived the rigors of achieving professional competence, are well-adjusted, intelligent and capable of coping with personal problems which stem from the dictates of the on-off patrol mission cycle. However, even those most capable of coping with the problems associated with rotation are apt to succumb to the pressures of overwork and continuously trying to resolve the conflicting demands of professional and family life.

Those crew members who exercise leadership and command duties are subject to special pressures for they, as individuals, not only experience the problems prompted by the on-off mission patrol cycle, but also have a responsibility for preserving the integrity of a combat-ready crew. While responsibility and accountability for mission effectiveness rests solely with the vessel commander, he is assisted in execution of his responsibilities by a staff qualified in the many disciplines vital



to the mission. Adequacy of mission accomplishment is measured in terms of both task-oriented factors (fulfilling operational requirements) which are controllable by the vessel commander, and by interpersonally-oriented factors (coping with the personal needs and problems of crew members) which are less controllable and often subject only to his influence. Accordingly, the effectiveness of submarine commanders is assessed in terms of tactical knowledge and performance factors such as shiphandling, crew qualification and retention, state of discipline, meeting schedules and deadlines, making contacts and remaining undetected, and other vessel-related matters. Achievement of effectiveness is facilitated by the high level of position-power given the vessel commander. This position-power is particularly useful in task-oriented situations where its use expedites control of vessel-related, highly structural problems for which performance standards are available. However, position-power cannot be used to control interpersonal problems and has limited significance in influencing interpersonal situations because they are not highly structured (for example, by regulation or procedure). Succinctly: the vessel commander has influence, but does not necessarily have decisive influence. Yet the way a vessel commander copes with interpersonal (particularly family) problems of the crew, and how well he motivates personnel (for example, to attain and retain full qualification) also may have significant impact upon the operational effectiveness of the ship as reflected in performance factors such as rates of absenteeism and retention. Thus vessel commanders are called upon to employ both position-power and influence in varying degrees--to display considerable leadership style-flexibility in dealing with a spectrum of situations which range from being task-oriented to

being interpersonally-oriented.

This following study, conducted in a shore-based Navy organization, examines a series of research questions concerned with whether leaders can adjust their leadership style to meet situational needs. It was found that individuals do exhibit style flexibility and that they alter leadership style with the nature of the situation. It was also concluded that the method employed in the study has potential for use in the study of operational organizations such as crews of FBM submarines.

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## CHAPTER I

### DESCRIPTION OF THE STUDY

#### Introduction

Research over the last forty years has failed to demonstrate unique leadership qualities that do not vary from situation to situation. "How leaders can initially motivate their groups to accept influence, the processes that underlie the continued exertion of influence, and the ways in which leaders can make unique contributions to group goal attainment . . ."<sup>1</sup> continue to absorb the efforts of researchers in the field of leadership in the formal organization.

Considerable contemporary research, under the guidance of Fred Fiedler, has concentrated on the personal need structure of the leader and on the interaction between the leader and the group that yields group effectiveness. The rationale for the research conducted was that inner needs have impact on maximum use of the skills and abilities required by group members to accomplish a particular task.<sup>2</sup> Although his early findings were encouraging, no simple relationship between leadership style and group performance emerged; therefore, Fiedler concluded that more attention should be given to situational

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<sup>1</sup>T. O. Jacobs, Leadership and Exchange in Formal Organizations (Alexandria, Virginia: Human Resources Research Organization, 1971), p. 17.

<sup>2</sup>Ibid., p. 48.

variables. This led him to formulate a Contingency Model of leadership effectiveness which ". . . postulates that leadership effectiveness depends on the appropriate matching of the individual's leadership style of interacting and the influence which the group situation provides."<sup>1</sup> But Fiedler found it impractical to identify ". . . individuals who can . . . adapt . . . leadership style to the particular situation;" rather, he found it meaningful to refer only to a leader "who . . . tends to be effective in one situation and ineffective in another."<sup>2</sup> This interpretation posed a question of the relative style flexibility of leaders which was examined by Walter Hill and which is reexamined in the current study.<sup>3</sup>

#### Statement of the Problem

The acceptance of a contingency model of leadership leads to the question of ". . . whether a leader can be sufficiently flexible to cope with varied situations, or whether the leader need be changed to match the situation or the situation modified to match leader capabilities."<sup>4</sup> Walter Hill set out to determine if subordinates perceive that their leaders use the same style of leadership for all problems, or if they perceive an alteration of leadership style as

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<sup>1</sup>F. E. Fiedler, A Theory of Leadership Effectiveness (New York: McGraw-Hill Book Company, 1967), p. 247.

<sup>2</sup>Ibid., pp. 254, 261.

<sup>3</sup>Walter A. Hill, "Leadership Style, Flexibility, Satisfaction, and Performance," Current Developments in the Study of Leadership, Ed. by Edwin A. Fleishman and James G. Hunt (Carbondale: Southern Illinois University Press, 1973), p. 63.

<sup>4</sup>Ibid., p. 64.



situations change. Findings of his study indicated that, as perceived by their subordinates, managers are capable of varying their style; and, that high style flexibility is related to subordinates' satisfaction with their superiors.<sup>1</sup> The basis of the findings on style flexibility was data collected using a sampling instrument he constructed, validated and tested for reliability in a United Kingdom setting. Hill defined leadership flexibility as subordinate managers' perceptions of the degree to which their superiors would use different leadership styles on different situations. The questionnaire he used described four possible leadership styles which a superior could employ, and four typical, but hypothetical, managerial problems. Combinations of four styles and four problems permitted identification of five degrees of style flexibility ranging from no variation in style to use of a different style for each problem.<sup>2</sup>

Fiedler's approach contends that different leadership behaviors are required in different situations to achieve effectiveness. His model deals primarily with two types of leadership style. An individual is identified as possessing a particular style by determining whether his least-preferred-coworker (LPC) score is high (a relationship-oriented

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<sup>1</sup>Ibid., pp. 78-82.

<sup>2</sup>The five degrees of style flexibility occurred when respondents perceived their superiors to use styles in the following combinations: one style for four problems, one style for three problems and a second for the fourth problem, one style for two problems and a second style for the other pair, one style for two problems and a second and a third style for the other two problems, and, a separate style for each of the problems. Style flexibility is elaborated in the Methodology section of this chapter.



style) or low (a task-oriented style).<sup>1</sup> Thus his model deals primarily with two types of leadership indicated by high and low-LPC scores. Little is known about individuals whose LPC falls in the range between high-LPC and low-LPC. Fiedler states ". . . it is possible that there is . . . more than one type of task and relationship orientation."<sup>1</sup> His model shows in what situations a given leadership style is more effective; but there is a question as to whether a leader can be sufficiently flexible to cope with varied situations, or whether the leader should be changed to match the situation or the situation modified to match leader capabilities.<sup>3</sup>

It is the intent of this paper to utilize Hill's methodology to replicate his leadership flexibility study in an American organization and to determine if Fiedler's LPC scoring system for classification of leadership style is related to the five degrees of style flexibility identified by Hill.

#### Purpose of the Study

This paper is addressed to a question that arises with acceptance of a contingency model of leadership, i.e., can the leader be sufficiently flexible to cope with varied situations? Contingency theories of leadership effectiveness postulate that different leadership behaviors are required in different situations where situations are defined

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<sup>1</sup>Least-Preferred-Coworker (LPC) scores are discussed further in the Methodology section of this chapter.

<sup>2</sup>Fiedler, Leadership Effectiveness, p. 264.

<sup>3</sup>Hill, "Leadership Style," p. 64.

in terms of variables which influence the desirability of particular types of leader behavior.<sup>1</sup> Fred Fiedler's theoretical and empirical work on his contingency model has provided considerable understanding and insight into the area of leadership; his work has served as a pathfinder in the investigation of the contingencies which have impact upon the effectiveness of particular leadership styles and behavior.<sup>2</sup> The model he developed, the Contingency Model of Leadership Effectiveness, holds promise of systematizing, simplifying, and bringing coherence into the search for an effective leadership theory.<sup>3</sup> It identifies the situations in which a particular leadership style would be most effective; i.e., it holds that effectiveness of a particular leadership style is contingent upon the situation.<sup>4</sup>

The Contingency Model is based on the concept that the effectiveness of a group, and therefore the leader, is dependent upon interaction of the leader's style of relating to group members and upon the amount of his influence in the group situation.<sup>5</sup> Fiedler holds that a

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<sup>1</sup>Fiedler, Leadership Effectiveness, p. 151; Edwin P. Hollander, "Style, Structure, and Setting in Organizational Leadership," Administrative Science Quarterly, Vol. 16, No. 1 (March, 1971), p. 2; and J. C. Wofford, "Managerial Behavior, Situational Factors, and Productivity and Morale," Administrative Science Quarterly, Vol. 16, No. 1 (March, 1971), p. 10.

<sup>2</sup>Robert T. Justis, "Leadership Effectiveness: A Contingency Approach," Academy of Management Journal, Vol. 18, No. 1 (March, 1975), p. 160.

<sup>3</sup>Walter Hill, "The Validation and Extension of Fiedler's Theory of Leadership Effectiveness," Academy of Management Journal, Vol. 12, No. 1 (March, 1969), p. 34.

<sup>4</sup>Fiedler, Leadership Effectiveness, p. 151.

<sup>5</sup>Ibid., p. 131.

leader may be effective in one situation but not another; and, that effective leadership, as measured by group performance, is dependent upon both leadership style and the situation. His model shows in what situations a given style of leadership is more effective; however, as indicated earlier, the question of style flexibility of the individual leader remains. Accordingly, the two main purposes of the study are:

1. To apply the Hill methodology to a managerial situation in the United States to determine the degree of leadership style variation perceived by subordinates; and, to determine how such variations (if any) are related to the nature of leadership problems, to superiors' performance evaluations of subordinates, and to subordinates' satisfaction with superiors.
2. To examine the relationship between Fiedler's Least-Preferred-Coworker score and the degrees of leadership flexibility identified by the Hill methodology.

#### Need for the Study

This study stems from a number of general issues and from some recognized gaps in the research supportive of the leadership literature.

Studies of leadership style changes in organizational settings have not been sufficiently exploited so as to enable one to understand the situational variables that modify leadership requirements.<sup>1</sup>

Leadership influence consists not only of what the superior is able to do himself or influence others to do directly, but more importantly,

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<sup>1</sup>Edwin A. Fleishman, "Overview," Current Developments in the Study of Leadership, Ed. by Edwin A. Fleishman and James G. Hunt (Carbondale: Southern Illinois University Press, 1973), p. 181.



it centers on the indirect impact of organizational phenomena such as delegation as a means of achieving decentralization. Satisfactory performance on the part of the superior probably depends in part on his possession of a cognitive map of what is good (effective) in his organization along with the skills needed to implement his plan.<sup>1</sup> Hence it is of value to relate exercise of leadership flexibility to managerial effectiveness as observed in the organizational setting.

There is a trend away from the assumption of simple linear relations to describe the data of leadership research. It is incomplete to talk about "high and low" considerations for structure, e.g., McGregor's dichotomy of Theory X and Theory Y, or, Fiedler's high- and low-LPC. Fiedler makes the point that he has dealt primarily with two styles of leadership and that ". . . we know very little about individuals . . . (in) the middle range."<sup>2</sup> This situation lends importance to the examination of the total spectrum of role behavior of effective supervisors in order to obtain a better understanding of the relationship between leadership and non-leadership in the supervisor's role and between leadership and group effectiveness.<sup>3</sup> Consistent with this trend, this study includes an examination of intermediate leadership styles, i.e., those in the mid-range of Fiedler's LPC scores.

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<sup>1</sup>T. O. Jacobs, "Discussant Comments," Contingency Approaches to Leadership, Ed. by James G. Hunt and Lars L. Larson (Carbondale: Southern Illinois University Press, 1974), p. 184.

<sup>2</sup>Fiedler, Leadership Effectiveness, pp. 261-264.

<sup>3</sup>Fleishman, "Overview," p. 180; Jacobs, Leadership and Exchange, p. 288; Abraham K. Korman, "Contingency Approaches to Leadership: An Overview," Contingency Approaches to Leadership, Ed. by James G. Hunt and Lars L. Larson (Carbondale: Southern Illinois University Press, 1974), p. 193.

While there is a growing acceptance of what is termed a contingency theory of leadership, a question raised by its acceptance is: Can "... a leader behave flexibly enough to cope with varied situations or, is ... it necessary to replace the leader as the situation changes or to modify the situation to fit the leader's capabilities"?<sup>1</sup> One answer, expressed by Tannenbaum and Schmidt, is that the successful leader is one who determines the "... most appropriate behavior at any given time ... and is ... able to behave accordingly."<sup>2</sup> A contrasting view expressed by Fiedler states that it is "... easier to change almost anything in the job situation than a man's personality and his leadership style."<sup>3</sup> This difference of views prompted Hill to examine the extent to which leaders vary behavior.<sup>4</sup>

The present study was addressed to producing additional research on leadership in the organizational setting, on the examination of other-than-the-extremes of the spectrum of leadership styles, and on further clarification of the dilemma regarding leadership style flexibility.

#### Research Focus

The focus of the current study was two-fold. First, it sought answers (in a United States Navy organization) to the series of research questions that Hill studied, and it identified differences between the

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<sup>1</sup>Hill, "Leadership Style," p. 64.

<sup>2</sup>R. Tannenbaum and W. H. Schmidt, "How to Choose a Leadership Pattern," Harvard Business Review (March-April, 1958), p. 301.

<sup>3</sup>F. E. Fiedler, "Engineering the Job to Fit the Manager," Harvard Business Review (September-October, 1965), p. 115.

<sup>4</sup>Hill, "Leadership Style," p. 64.

results of the two studies. Secondly, it examined (among middle and first-line managers) the possibility of a relationship between leadership style flexibility, as determined from the use of the instrument developed by Hill, and Least-Preferred-Coworker scores, obtained from the use of Fiedler's instrument.

A preliminary step in replication of Hill's research was to establish the independence of observations, i.e., to determine whether the observations made by Hill in his research affected the probability that observations in the current study would be the same. This involved answering the following research question:

1. Are leadership flexibility observations in the current study independent of those observed by Hill?

The first objective of this study was to replicate Hill's research and compare the results of the two studies. This made it necessary to seek answers to the following questions which were asked by Hill.

2. Do subordinates perceive leaders using the same style of leadership for a variety of problems, or do they perceive leaders altering style to meet different situations?

3. Do leaders vary leadership style with the nature of the problem? If so, is the change more pronounced for middle or for first-line managers?

4. Is perceived flexibility related to performance evaluations of subordinates by superiors?

5. Is perceived flexibility related to subordinate's satisfaction with superiors?



The second objective of this study was to examine the relationship between leadership style flexibility, as measured by the Hill methodology, and the Least-Preferred-Coworker (LPC) scores of Fiedler. Fiedler postulated that ". . . leadership effectiveness depends upon . . . matching the individual's leadership style . . . and the influence which the group situation provides."<sup>1</sup> He viewed leadership style as ". . . determined by the needs the individual (supervisor) seeks to satisfy in the leadership situation", and developed the Least-Preferred-Coworker (LPC) instrument to measure leadership styles.<sup>2</sup> Fiedler dealt with only the two styles of leadership measured by high- and low-LPC scores while Hill, in contrast, reported a range of five styles from high rigidity to high flexibility. Since the range of styles reported by Hill and Fiedler's LPC scores had not been compared, this study also answers the following research question:

6. Is perceived flexibility (as determined by the Hill methodology) related to Least-Preferred-Coworker (LPC) scores (as determined by Fiedler's instrument)?

#### Methodology

The replicative thrust of this study dictated use of the methodology employed by Hill, while the aspect concerning the relationship between leadership style flexibility and Least-Preferred-Coworker required

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<sup>1</sup>Fiedler, Leadership Effectiveness, p. 247.

<sup>2</sup>Ibid, p. 247.

the use of an instrument developed by Fiedler.<sup>1</sup> The instruments employed are briefly identified below; each is discussed more fully in a later section of this chapter.

1. The instruments used by Hill to gather data on leadership flexibility, performance, and satisfaction were also employed in the current study.

- a. The instrument employed to collect leadership flexibility data was constructed by Hill, subjected by Hill to pre-test, and finally modified into a usable instrument as depicted in Figure 1.<sup>2</sup>
- b. The performance evaluation instrument employed by Hill was extended to include an additional effectiveness report.<sup>3</sup>
- c. Leadership satisfaction data were collected and measured using the Job Descriptive Index of Smith, Kendall and Hulin.<sup>4</sup>

2. The Least-Preferred-Coworker questionnaire, developed by Fiedler to provide a relatively simple method for measuring interpersonal perceptions, was used.<sup>5</sup>

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<sup>1</sup>Hill, "Leadership Style," pp. 62-83; Fiedler, Leadership Effectiveness, pp. 40-41.

<sup>2</sup>The sequence of events leading to Hill's final instrument is illustrated in Figure 1.

<sup>3</sup>U. S. Department of Air Force, Field Grade Officer Effectiveness Report, A. F. Form 707, November, 1971.

<sup>4</sup>P. C. Smith, L. M. Kendall and C. L. Hulin, The Measure of Satisfaction in Work and Retirement (Chicago: Rand McNally, 1969), p. 83.

<sup>5</sup>Fiedler, Leadership Effectiveness, p. 38.

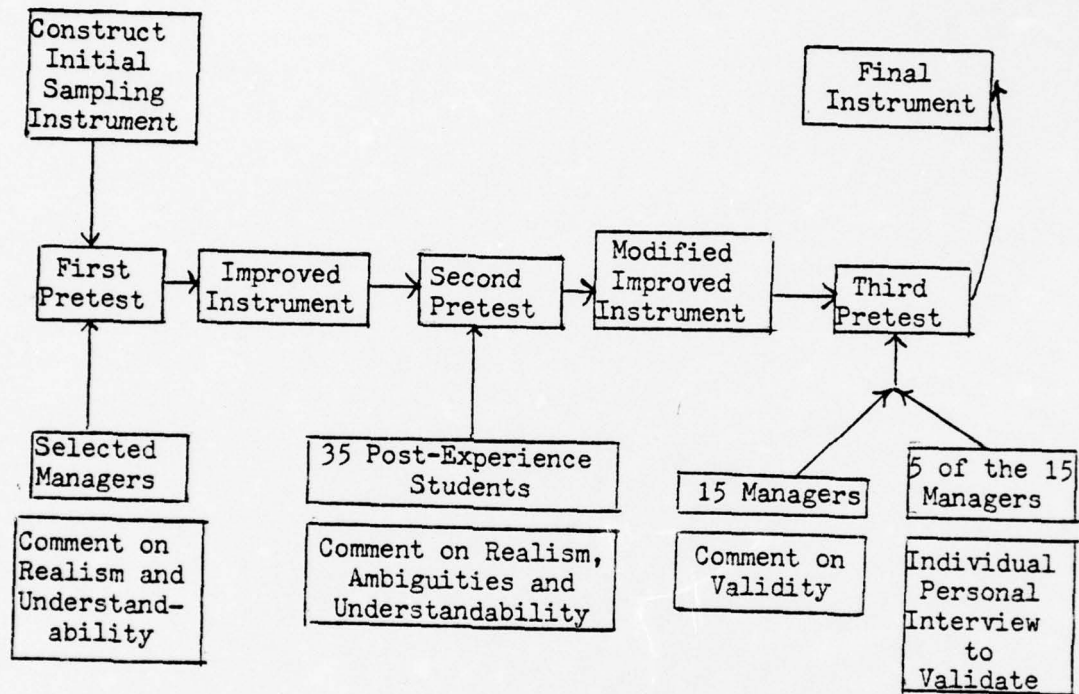


Figure 1. Development of Hill's Leadership Flexibility Instrument<sup>1</sup>

<sup>1</sup>This is a summary based on an analysis of Hill's report in "Leadership Style", pp. 65-66.



### Sources of Data

There were two sources of data for this investigation: 1) Results of the research conducted by Walter Hill, and 2) a field study. The data in the research report of Walter A. Hill were used as the basis for comparing the results of the two studies.<sup>1</sup> The remaining data utilized in this study stemmed from a field study conducted with a group of 129 managers in the Naval Training Equipment Center located in Orlando, Florida. The choice of a United States Navy organization was made within the framework of an agreement between Provost Robert M. Johnson, Florida State University and the Chief of Naval Education and Training Support. This agreement, selection of the field research site, and selection of managers for participation in the study are discussed in Chapter III.

### Research Instruments

The questionnaire technique was used as the primary means of data collection. This choice stemmed from consideration of three factors: The requirement to replicate the method used by Hill, the desirability of uniformity from one measurement situation to another, and the hope that respondents would have greater confidence in their anonymity and thus feel freer to express views about their superiors. The interview technique was employed only to the extent necessary to avoid misinterpretation, to clarify and to avoid recording baffling responses by the respondent.

Separate instruments were used to measure the study variables.

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<sup>1</sup>Hill, "Leadership Style," pp. 62-85. This report is discussed as part of the literature review in Chapter II, and the results reported by Hill are presented in Appendix B.

Each of the four instruments employed is discussed in the following section. Figure 2 depicts the relationship among the four instruments.

#### Leadership Flexibility Instrument

The Leadership Flexibility Instrument (developed by Hill and presented in Appendix A) describes four leadership styles available for use by a manager to solve four different problems.

The four leadership styles were designated A, B, C, and D. Styles A and B were directive in character. The style A manager placed major emphasis on getting the job done, expected subordinates to accept and follow directions, and was not overly concerned with feelings and attitudes of subordinates. The style B manager, while still directive, recognized that good human relations were helpful in encouraging subordinates to effectively implement the tasks prescribed and directed by him. Styles C and D were both non-directive and participatory in character. The style C manager recognized his primary concern as the development and maintenance of positive attitude among subordinates, but also placed emphasis on getting the job done by taking charge and insuring that a solution was developed and put into action by subordinates. The style D manager gave major emphasis to building and maintaining good human relations and to getting subordinates involved in problems so they would develop and implement good solutions without direction.

The four different problems (situations) were designated as 1, 2, 3, and 4. The first problem reflected a complex interpersonal situation in which the manager was faced not only with many potentially conflicting criteria but also had no immediate way to prove that a decision

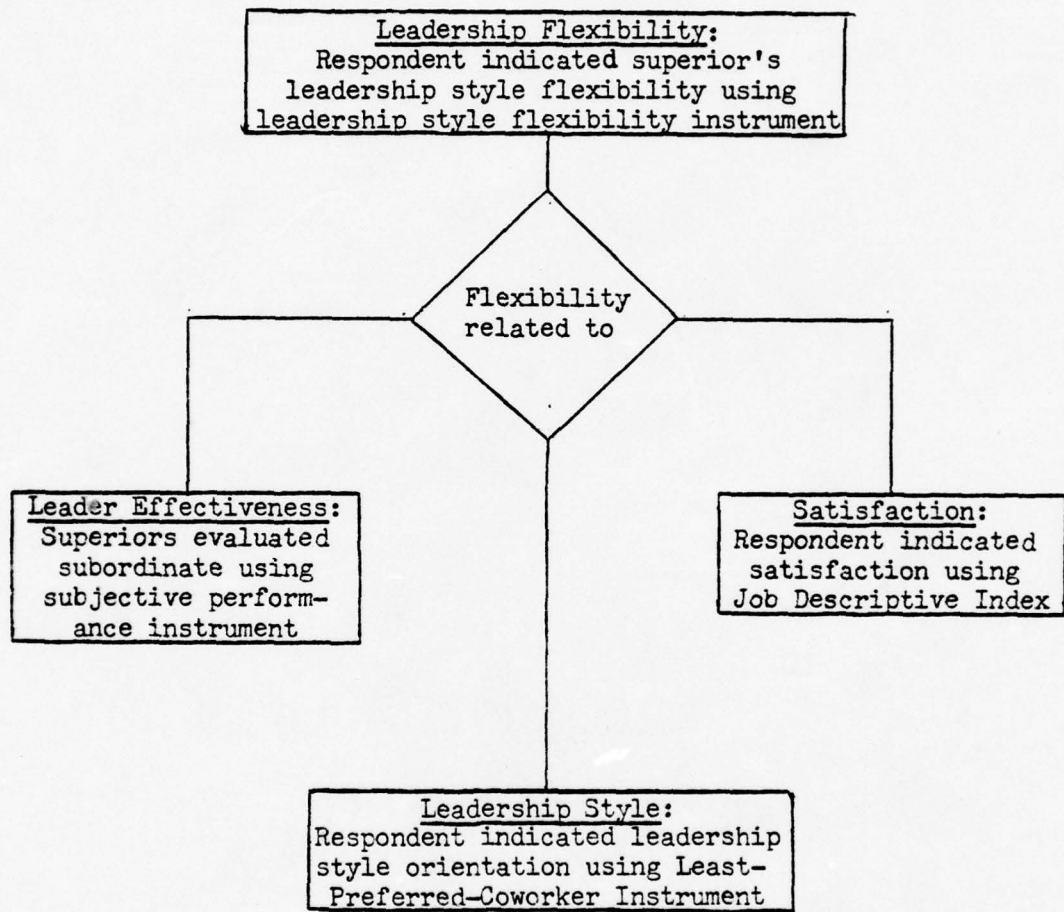


Figure 2. Relationship Among Research Instruments



TABLE 1  
SUMMARY OF LEADERSHIP STYLES AND MANAGERIAL PROBLEMS

Leadership Styles		Managerial Problems	
Style	Description	Problem	Nature of Problem
A: <u>Directive</u> (Primarily task oriented)	Manager not too concerned with feelings and attitudes of subordinates. Believes these matters are not part of manager's job.	1 <u>Interpersonal</u>	Complex decision which involves an emotionally charged interpersonal decision.
B: <u>Directive</u> (Primarily task oriented and secondarily interpersonal)	Manager recognizes need to maintain good interpersonal relations. Clearly human relations secondary to getting job done.	2 <u>Technical</u>	Complex problem which is <u>not</u> interpersonal in nature.
C: <u>Non-directive</u> (Primarily interpersonal and secondarily task oriented)	Manager primarily concerned with developing and maintaining positive feelings and attitudes. Feels he must insure that wise decisions are made and implemented by subordinates.	3 <u>Interpersonal</u>	Simple problem which involves an interpersonal decision.
D: <u>Non-directive</u> (Predominantly interpersonally oriented)	Manager puts emphasis on developing and maintaining positive feelings and attitudes. Expects people to solve own problems and free him from insuring that decisions are made and implemented.	4 <u>Technical</u>	Simple problem which involves a technical decision.
NOTE: Each problem has two of the four problem attributes. Accordingly, problems were categorized by Hill as being interpersonal/complex; technical/complex; interpersonal/simple; and technical/simple.			
SOURCE: Hill, "Leadership Style", pp. 66-67.			

taken was correct. The second problem, also made complex by potentially conflicting criteria and no early way to determine correctness of a decision, reflected a technical situation. The third problem reflected a simple interpersonal situation, and the fourth problem reflected a simple technical situation. In both of these latter problems there were few alternatives, and it was relatively easy to determine quickly the correctness of a decision.

The styles and problems (situations) are summarized in Table 1. Respondents were asked to indicate which of the four styles their immediate supervisor would use to solve each of the four different problems. The degree of leadership style flexibility that respondents ascribed to their superiors was determined by applying the criteria summarized in Table 2 to respondents' choices. Application of these criteria permitted a determination of the proportions of managers perceived to be in each of the five leadership style-flexibility groups.

TABLE 2  
LEADERSHIP STYLE FLEXIBILITY, CRITERIA

Leadership Style-Flexibility (SF) Group Notation	Criteria Employed by Hill
SF-0	Subordinate perceives superior using: The same style for each of four situations.
SF-1	One style in three of the situations and a different style in the fourth.
SF-2	Two different styles with each style employed in two situations.
SF-3	Three different styles with one style used twice and the other two styles used once.
SF-4	Four different styles with a different style used for each of the situations.

SOURCE: Hill, "Leadership Style," pp. 67-68.

### Leadership Performance Instruments

Two instruments were employed at the Naval Training Equipment Center for performance evaluation of subordinate managers by their superiors. These instruments are illustrated in Appendix A as Part One and Part Two of the Performance Evaluation Questionnaire.

#### The First Instrument (Part A)

The first instrument is the same as Hill used to obtain an evaluation of the performance of each respondent by his superior. The instrument provided the evaluator with a list of ". . . six criteria generally considered important to managerial effectiveness; for example, how well . . . he plan(ned) his work."<sup>1</sup> Instructions directed the evaluator first to consider the specific assignment of the subordinate and rank the six criteria in order of importance of the criteria to the assignment of the individual. Secondly, the evaluator was asked to render an evaluation of how well the subordinate performed with respect to each of the criteria, i.e., to rate the individual by placing an (X) in the box the evaluator deemed most appropriate. The score was determined by multiplying the rank (criteria) number by the rate (performance) number for each of the six combinations and then taking the sum of the six products.

#### The Second Instrument

The second instrument used only in the current study is an abridgment of the Field Grade Officers Effectiveness Report, Air

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<sup>1</sup>Hill, "Leadership Style," p. 68.



Force Form 707.<sup>1</sup> It is abridged in the sense that it deletes items such as identification data, description of present duty, and provisions for overall evaluation of the individual being rated. It is similar to Hill's instrument in that it uses a ". . . six-point scale which ranges from 'superior, should be promoted' to 'unsatisfactory, should be replaced'".<sup>2</sup> It differs from Hill's instrument in that for each rating factor (criterion) the evaluator is presented with a series of five brief descriptions, each indicative of a changing degree of satisfaction with how well the subordinate is performing his job with respect to the criterion under consideration.

Instructions directed the evaluator to select that description which best fitted the individual being rated (by placing an (X) in the appropriate box). Calculation of the performance score required that the columns be numbered 1 through 5, starting from the left. The number of (X) marks in each column was multiplied by the number at the top of the column. In row 7, 'read' and 'write' were treated as separate rows. The score was determined by taking the sum of the products in all columns.

#### Leadership Satisfaction Instrument

The Job Descriptive Index, developed by Smith, Kendall, and Hulen as part of the Cornell Studies of Satisfaction, was used to

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<sup>1</sup>U. S. Department of Air Force, Field Grade Officer Effectiveness Report, A. F. Form 707, 1971.

<sup>2</sup>Hill, "Leadership Style," p. 64.

determine a leadership satisfaction score.<sup>1</sup> The instrument is presented in Appendix A.

The Job Descriptive Index (JDI) was job rather than self referent. It did not ask the respondent directly how satisfied he was with his superior but rather it required the respondent to indicate if the item on the instrument described the particular aspect of the supervision he received. The descriptive format was used by Smith et al., because describing some specific aspect of a job was easier for the respondent than trying to describe internal states of feeling.

Procedurally, each respondent in the current study was provided with a list of adjectives and short phrases and instructed to indicate whether each word or phrase applied to the supervision he received on his job. If a word or phrase applied to his supervisor, he was asked to indicate "yes" beside that word or phrase. If the word or phrase did not apply he was asked to indicate "no". If the respondent could not decide, he was asked to enter a question mark. Each of the eighteen items in the Job Descriptive Index Instrument was assigned a value using the weighting information contained in Table 3.<sup>2</sup> The satisfaction score was determined by taking the sum of the weighted responses.

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<sup>1</sup>Smith, Kendall, and Hulin, The Measure of Satisfaction in Work and Retirement, pp. 69-85.

<sup>2</sup>Ibid., p. 79.

TABLE 3  
 INFORMATION FOR WEIGHTING ANSWERS

Response	Weight
Yes (to positive item)	3
No (to negative item)	3
? (to any item)	1
Yes (to negative item)	0
No (to positive item)	0

SOURCE: Smith, The Measure of Satisfaction in Work and Retirement, p. 79.

#### Style of Leadership Instrument

The Least-Preferred-Coworker Instrument was used to determine leadership styles. This instrument was developed by Fiedler as part of his leadership effectiveness program in which he theorized that the performance of a group ". . . depends on both the leader's style of interacting with his group members and the nature of the group situation in which he and his group found themselves."<sup>1</sup>

The instrument asked the respondent to describe the person in his working life with whom he had been able to cooperate least well, that is, his Least-Preferred Coworker (LPC).<sup>2</sup> The instrument is

<sup>1</sup>Fiedler, Leadership Effectiveness, p. 36.

<sup>2</sup>Ibid., p. 37.



presented in Appendix A.<sup>1</sup>

The Least-Preferred-Coworker instrument is a semantic differential device containing sixteen bipolar adjective items. Each respondent was asked to describe his least-preferred coworker by considering each pair of adjectives in turn and by placing an (X) in one of the eight spaces between the pairs. The most favorable position on the scale for each adjective was assigned a weight of eight points, and each intermediate position a lesser score down to a single point for the least favorable response. The Least-Preferred-Coworker (LPC) score was generated as the average of the sum of the sixteen individual item scores.

Fiedler interpreted high-LPC scores as representative of a relationship (interpersonal) orientation and low-LPC scores as representative of task (technical) orientation of the respondent. He reported low-LPC scores as being in the region of 1.2 to 2.2 and high-LPC scores in the region of 4.1 to 5.7.<sup>2</sup>

#### Analysis of Research Questions

The following sections provide a discussion of each of the six research questions identified earlier in the Research Focus section of this chapter. Since these research questions were not testable directly, the substantive content of each research question was tested through the use of statistical hypotheses, each of which expressed an aspect of a particular research question. The null hypothesis, that is a

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<sup>1</sup>Ibid., p. 41.

<sup>2</sup>Ibid., p. 44.

statistical proposition that there is no relation between variables of the problem, was employed in each instance.

The procedure for either accepting or rejecting the hypotheses (and thus answering the research questions) involved the six steps identified below.<sup>1</sup>

1. A statement of the null hypothesis ( $H_0$ ).
2. Choice of a statistical test.
3. Specification of a significance level ( $\alpha$ ).
4. Definition of a region of rejection.
5. Computation of the value of the statistic.
6. Application of following decision rule:
  - a. If value of statistic is in the region of rejection, the decision is to reject the null hypothesis.
  - b. If the value of the statistic is outside the region of rejection, the decision is that  $H_0$  can not be rejected at the specified level of significance.

The operations allowable on the set of numerical scores collected as a result of field research were dependent upon the level of measurement involved.<sup>2</sup> The instruments employed in the field test resulted in scores which have the strength of ranks; e.g., some responses indicate greater job satisfaction, greater leadership style flexibility, or better job performance than other responses. These scales did not meet the requirements of higher levels of measurement,

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<sup>1</sup>Sidney Siegel, Non-Parametric Statistics (New York: McGraw-Hill Book Company, 1956), pp. 7-14.

<sup>2</sup>Ibid., pp. 24-25, 30.

i.e., interval or ratio, and are viewed as ordinal. Considering ordinal scaling, hypotheses were tested using non-parametric statistical tests; correlation coefficients were based on rankings (e.g., Spearman  $\gamma_s$ ), and the median was used as the statistic most appropriate for describing central tendency.

Hypotheses and statistical tests used in the analyses of each of the research questions are discussed below. Hypothesis One and Two are associated with Research Question One; Hypotheses Three and Four with Question Two; Hypotheses Five through Eleven with Question Three; Hypotheses Twelve and Thirteen with Question Four; Hypothesis Fourteen with Question Five; and Hypothesis Fifteen with Question Six.

#### Research Question One

The first research question asked: Are the leadership flexibility data observed in the current study independent of those observed by Hill? The answer to this question involved a determination, first, of whether the response was different from that expected by chance and, then, whether the response was different from that observed by Hill. The answer is based on a test of the following two hypotheses:<sup>1</sup>

#### Hypothesis One

$H_0$ : The distribution of style flexibility groups observed in the current study is a uniform distribution.

$H_a$ : The distribution of style flexibility groups observed in the current study is not a uniform distribution.

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<sup>1</sup>Data of research consisted of frequencies in discrete categories. The chi-square tests for significance referred to in this section were conducted as described by Siegel, Non-Parametric Statistics, pp. 104-111.



If each of the five style-flexibility classes was perceived by respondents in equal numbers, the pattern of expected response would be a uniform distribution. Test of this hypothesis determined whether the difference between the actual data and the expected data was one that could be observed if the universe were uniformly distributed. "Two observations are considered to be independent when information about one of them provides no clue whatever as to the other. Two observations are considered to be dependent if it is possible to make a better guess about one of them when you know what the other one is."<sup>1</sup>

#### Hypothesis Two

$H_0$ : The incidence of subordinates perceiving superiors to be in each of the five style-flexibility groups is independent of (i.e., not dependent upon) the study in which the observations were made.

$H_a$ : The incidence of subordinates perceiving superiors to be in each of the five style-flexibility groups, is dependent upon the study in which the observations were made.

#### Research Question Two

This research question asked: Do subordinates perceive leaders using the same style of leadership for a variety of problems, or do they perceive leaders altering style to meet different situations? The response to this question involved an analysis of the overall

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<sup>1</sup>Helen Walker and Joseph Lev, Statistical Inference (New York: Henry Holt and Company, 1953), p. 14.

response to the Leadership Flexibility Instrument to determine the proportions of respondents at each management level that perceived their superiors to be in each of the style-flexibility groups. It also involved testing of the following two hypotheses, using a chi-square test.

#### Hypothesis Three

$H_0$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is no significant difference between the proportions observed by Hill and the proportions observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is a significant difference between the proportions observed by Hill and the proportions observed in the current study.

#### Hypothesis Four

$H_0$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is no significant difference between the proportion of middle managers and proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is a significant difference between the proportion of middle managers and proportion of first-line managers observed in the current study.

Tests of these two hypotheses were made to determine whether the difference between data sets was statistically significant.

### Research Question Three

This research question asked: Do leaders vary leadership style with the nature of the problem? If so, is the change more pronounced for middle or for first-line managers? The response to this question involved answering three corollary questions. The first two corollary questions asked:

1. What proportion of respondents perceived that their superiors categorized problems as dichotomous pairs, i.e., used one style for two complex problems and another style for two simple problems, or, used one style for two interpersonal problems and another style for two technical problems.

2. What proportion of respondents perceived that their superiors categorized problems in terms of like problem attributes, i.e., used the same style for problems which share one of the four problem attributes.

The basis of Hill's response to the research question was contained in the answers to the above two corollary questions. Data gathered in this study prompted testing of the following hypotheses associated with the above two corollary questions, using a chi-square test.

### Hypothesis Five

$H_0$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no



significant difference between the proportions observed in the current study and those observed by Hill.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant difference between the proportions observed in the current study and those observed by Hill.

#### Hypothesis Six

$H_o$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

#### Hypothesis Seven

$H_o$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant

difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

Tests of the above hypotheses were made to determine whether the difference between data sets was statistically significant.

#### Hypothesis Eight

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportions observed in the current study and those observed by Hill.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is a significant difference between the proportions observed in the current study and those observed by Hill.

#### Hypothesis Nine

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for

problems with like problem attributes there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

#### Hypothesis Ten

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

Tests of these three hypotheses were made to determine whether the difference between data sets was statistically significant.

The following corollary to the third research question served to extend examination of the question of how leaders vary leadership style with the nature of the problem beyond that presented by Hill.

3. What proportions of respondents in each style-flexibility group perceived superiors to place problems in each of the four categories of like problem attributes and in each of the two categories of an admixture of all problem attributes. The response to this



question required additional analysis of data associated with Flexibility Styles SF-1, SF-2, and SF-3 and testing of Hypothesis Eleven.

#### Hypothesis Eleven

$H_0$ : Regarding the proportion of managers in the intermediate flexibility styles (SF-1, SF-2, and SF-3) perceived to vary leadership styles with the nature of the problem attributes there is no significant difference between the proportions of middle managers and first-line managers so perceived.

$H_a$ : Regarding the proportion of managers in the intermediate flexibility styles (SF-1, SF-2, and SF-3) perceived to vary leadership styles with the nature of the problem attributes there is a significant difference between the proportions of middle managers and first-line managers so perceived.

This hypothesis was tested to determine if there was a significant difference between the results observed for middle and for first-line managers.

#### Research Question Four

This research question asked: Is perceived flexibility related to performance evaluations of subordinates by superiors? The response to this question involved preparation of separate flexibility-performance frequency tables for data obtained from each of the Leadership Performance instruments. Since the data consisted of

frequencies in discrete categories (the number of respondents in each Style-Flexibility group that were rated at specific levels of leadership performance by their superiors) the chi-square test was used to determine the significance of differences between independent groups.<sup>1</sup> The null hypothesis tested was that the level of leadership performance does not differ with respect to style flexibility groups and therefore with respect to the relative frequency with which group members fall into intervals representing levels of leadership performance. The following hypothesis was tested first with data collected, using the instrument employed by Hill, and then with data collected from the abridgment of the Field Grade Officer Effectiveness Report.

#### Hypothesis Twelve

$H_0$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility the proportion of supervisors evaluated to be in each of the performance intervals is the same in all style-flexibility groups.

$H_a$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility the proportion of supervisors evaluated to be in each of the performance intervals is not the same in all style-flexibility groups.

This hypothesis was tested to determine if perceived flexibility was related to leadership performance evaluations as measured by either or both of two performance instruments.

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<sup>1</sup>Siegel, pp. 174-179.

A determination was also made as to whether there was a significant difference between the performance ratings obtained by each of the two instruments. Since the responses from both instruments could be ranked in two ordered series, the Spearman Rank Correlation Coefficient ( $r_s$ ) was used as a measure of association between the two sets of ranks.<sup>1</sup> A test of the significance of the coefficient involved a test of the null hypothesis that the two sets of scores were not associated in the population and that the observed value of  $r_s$  differed from zero only by chance. The associated probability of the occurrence of a value as large as the observed value of  $r_s$  was determined by computing the student-t value associated with the value of  $r_s$  using the formula:

$$t = r_s \sqrt{\frac{N-2}{1-r_s^2}} \quad (\text{where } N = \text{sample size})$$

The significance of  $t$  was determined by reference to a table of the critical values of  $t$ .

#### Hypothesis Thirteen

$H_0$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility, the performance ratings as determined by the first instrument and the performance ratings as determined by the second instrument are unrelated in the population; i.e., they are not associated in the population of scores.

$H_a$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility the performance ratings as determined by the first instrument and the performance ratings as determined by the second

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<sup>1</sup>Ibid., pp. 202-213.



instrument are related in the population; i.e., they are associated in the population of scores.

This hypothesis was tested to determine the extent of association or relation between performance as evaluated by the instrument employed by Hill and as evaluated by the Field Grade Officers Effectiveness Report.

#### Research Question Five

This research question asked: Is perceived flexibility related to subordinates' satisfaction with superiors? The response to this question involved preparation of a flexibility-satisfaction frequency table for data obtained from the Job Descriptive Index instrument. Since the data consisted of frequencies in discrete categories (the number of respondents in each Style Flexibility group who indicated specific levels of job satisfaction) the chi-square test was used to determine the significance of differences between the independent groups.<sup>1</sup> The null hypothesis tested was that the level of job satisfaction does not differ with respect to style flexibility groups and therefore with respect to the relative frequency with which group members fall into intervals representing degrees of satisfaction. The assembled data were used to test the following hypothesis.

#### Hypothesis Fourteen

H<sub>0</sub>: Regarding subordinates' satisfaction with superiors perceived to use varying degrees of leadership style flexibility the proportion of supervisors observed to be in

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<sup>1</sup>Siegel, pp. 174-179.

each of the satisfaction intervals is the same in all style-flexibility groups.

$H_a$ : Regarding subordinates' satisfaction with superiors perceived to use varying degrees of leadership style flexibility the proportion of supervisors observed to be in each of the satisfaction intervals is not the same in all style-flexibility groups.

This hypothesis was tested to determine if perceived flexibility was related to job satisfaction as indicated by the Job Descriptive Index.

#### Research Question Six

This research question asked: Is perceived flexibility (as determined by the Hill methodology) related to Least-Preferred-Coworker (LPC) scores (as determined by Fiedler's instrument)? Response to this question required a measure of the extent of association between two sets of characteristics (LPC scores and Style Flexibility).

The contingency coefficient  $C$  is a nonparametric measure of the extent of association or relation between two sets of attributes.<sup>1</sup>

The observed frequencies of occurrence of scores within LPC intervals for each of the style-flexibility groups were arranged in a contingency table for computation of a chi-square value. The value of the contingency coefficient  $C$  was computed by inserting the value of chi-square in the formula  $C = \sqrt{\frac{X^2}{N + X^2}}$ . The following hypothesis was tested to determine the significance of the association, using the

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<sup>1</sup>Ibid., pp. 196-202.

chi-square statistic.

#### Hypothesis Fifteen

$H_0$ : Regarding the relationship between Least-Preferred-Coworker scores and leadership style flexibility the observed value of the contingency coefficient could have arisen by chance in a random sample from a population in which Least-Preferred-Coworker scores and leadership style flexibility were not correlated.

$H_a$ : Regarding the relationship between Least-Preferred-Coworker scores and leadership style flexibility the observed value of the contingency coefficient could not have arisen by chance in a random sample from a population in which Least-Preferred-Coworker scores and leadership style flexibility were not correlated.

#### Limitations of the Research

Certain limitations restrict the inferences and conclusions that can be drawn from this research. Some of these arise because of the special group selected for analysis, and others are more a function of the procedures used in data collection and analysis. The empirical results of this study constitute both a test of a methodology developed by Walter Hill for determining the style flexibility of leaders and a determination of the relationship (if any) between style flexibility and Least-Preferred-Coworker scores. As such, the specific results are limited to the data gathered as part of a field study at the Naval Training Equipment Center during July, 1975. When combined with future



tests, however, it is anticipated that the methodology will be applicable to structurally similar organizations. No attempt was made to identify specific personality traits of the participants, nor does the study include demographic factors. Therefore, this research may not be compared directly to those that do. It is not felt that responses given by first-line and middle managers in the current study would differ significantly from those of other organizations.

#### Outline of the Study

The following paragraphs provide an overview of the organization of this research.

Chapter I includes a statement of the problem, the purpose, importance and focus of the research, research questions to be answered,, hypotheses to be tested, the limitations of the research and the organization of the research.

Chapter II contains a review of the literature directly related to the evolution of the contingency approach to leadership theory, a discussion of Fred Fiedler's Contingency Model of leadership effectiveness, some comments regarding the validity of the model, leadership style, and the flexibility of leadership style. It also contains a discussion of Hill's research on leadership style flexibility.

Chapter III presents a discussion of the research methodology employed. It includes a description of the selection of the field research site, the selection of managers for participation in the study, the development of the questionnaire, and a discussion of the statistical approach used. The description of the gathering of data from the

respondents, problems encountered, and solutions used are also included.

Chapter IV presents the findings pertaining to leadership style-flexibility. It includes a general description of the survey respondents, a presentation and analysis of data for the first three research questions, and a comparison of the results obtained in the two studies. It includes tests of the statistical hypotheses used to examine the substantive content of the first three research questions.

Chapter V presents the findings pertaining to evaluation of leadership performance, satisfaction with leadership, and leadership style, each as related to leadership style flexibility. It includes a presentation and analysis of data for the last three research questions and, with the exception of Research Question Six, a comparison of the results obtained in the two studies.

Chapter VI presents a summary of the overall study. It presents specific conclusions regarding each of the six research questions and the methodology employed. Generalizations that may be inferred from the specific test conditions and recommendations for future research are also presented.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Introduction

The topic of leadership has been important since the earliest families of man.<sup>1</sup> In simple organizations, such as the early tribal group, the process of leadership was not complicated by the problems which now occur due to size, technical complexity and the social demands placed on modern organizations. There are many books and articles on how to be a good leader; advice ranges from homilies such as being loyal, honest, good, and fair to the more cynical guidelines expressed by Niccolo Machiavelli in The Prince. The control of others for the purpose of accomplishing a common task, a common definition of leadership, is both a necessary and desirable skill, and it is likely to remain so as long as we must cope with tasks which one man cannot accomplish without the assistance of others.

The literature concerning leadership is general and extensive. The search for works relevant to this study focused on where the Contingency Model fits in the pattern of prior examination of

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<sup>1</sup>Catheryn Seckler, "Leadership in Management", in Management: Concepts and Practice, Ed. by Fred R. Brown (Washington, D.C., Industrial College of the Armed Forces, 1963), pp. 35-37; Fred E. Fiedler, A Theory of Leadership Effectiveness, (New York: McGraw-Hill Book Company, 1967), pp. 1-5; and N. Machiavelli, "The Prince", in Machiavelli: The Chief Works and Others, Trans. by Allan Gilbert (Durham, N.C.: Duke University Press, 1965), pp. 35-39.



leadership phenomena. Only that research bearing on the problem of leadership style and its flexibility was included; the particular focus was developed following the pattern shown in Figure 3.

The remainder of this chapter presents the evolution of the contingency approach, a discussion of Fred Fiedler's Contingency Model of leadership effectiveness, some comment regarding the validity of the model, leadership style, and the flexibility of leadership style.

#### Evolution of the Contingency Approach

This section provides a review of relevant literature in order to place the current research in perspective in terms of what has happened in the past. Stogdill grouped the many theories of leadership into six chronological categories; however, his historical sequence is imperfect because closely related studies are grouped together regardless of when the research occurred. His treatment makes it evident that there is no clear time of demarcation between schools of thought represented by the six categories; i.e., that serious attempts to gain a better understanding of leadership proceeded from several points of view at the same time.<sup>1</sup>

The six categories identified by Stogdill were: 1) Great Man Theories, 2) Situational or Environmental Theories, 3) Personal-

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<sup>1</sup>The six categories were used as a framework for this discussion since they were identified in a comprehensive survey of leadership theory and research. The comprehensive nature of the book is illustrated by the fact that more than five thousand abstracts of material with a direct bearing on leadership were prepared and used in writing the book according to Ralph M. Stogdill, Handbook of Leadership (New York: The Free Press, 1974), p. vii, vii and 17.

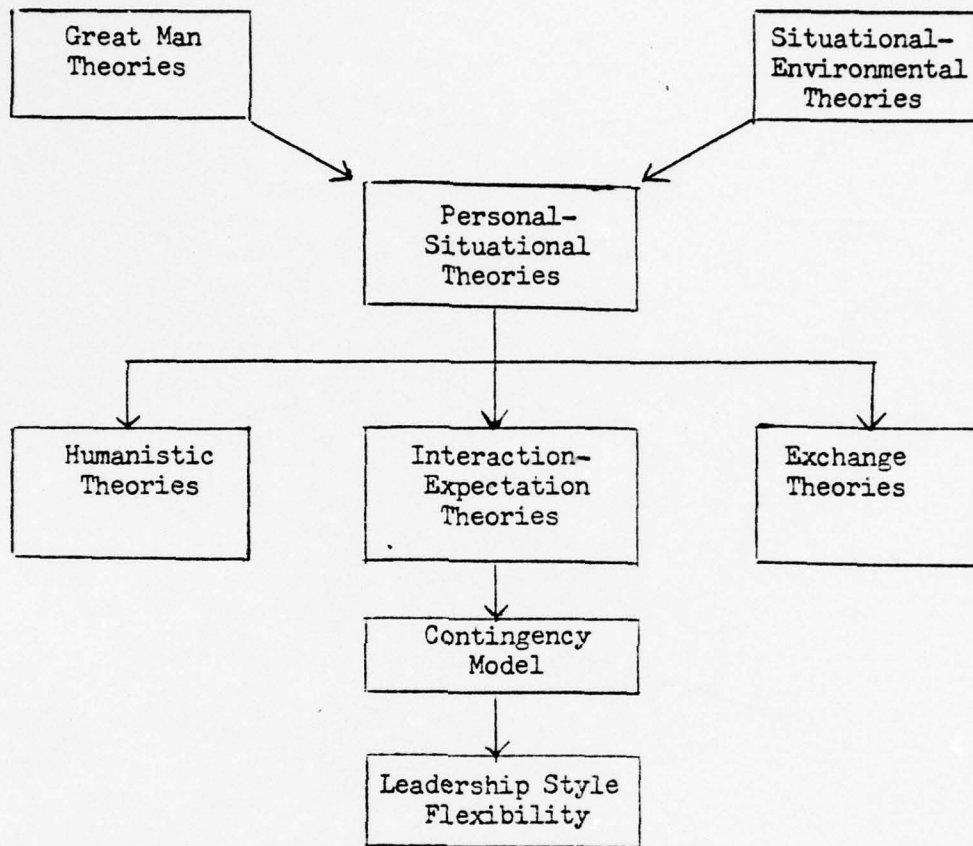


Figure 3. Leadership Style Flexibility and the Six Categories of Theories<sup>1</sup>

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<sup>1</sup>Ralph M. Stogdill, Handbook of Leadership (New York: The Free Press, 1974), pp. 17-31.

Situational Theories, 4) Interaction-Expectation Theories, 5) Humanistic Theories, and 6) Exchange Theories.<sup>1</sup> The first three of these categories (groups of theories) form the basis of all contemporary research and are discussed in the next following section. The category which groups Interaction-Expectation Theories together includes the contingency approach which is discussed in a later section. Humanistic Theories express the view that it is the function of leadership to modify organizations in order to provide freedom for the individual to realize his own potential for fulfillment of his own needs. Exchange Theories assume that social interactions represent a form of exchange in which group members make contributions at a cost to themselves and receive returns at a cost to the group or other members. These latter two categories are beyond the scope of this study and are excluded from further discussion.

#### Basis of Contemporary Research

Early explanations of leadership phenomena were given in terms of personal qualities that characterized the individual and established his dominance and influence in any situation.<sup>2</sup> Later, attempts were made to identify different types of leadership and to relate them to societal needs through analysis of the qualities of the leader or the nature of the situation, but there was a lack of consideration of interaction between individual and situational variables.

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<sup>1</sup>Ibid., pp. 17-31.

<sup>2</sup>Cecil A. Gibb, "Leadership: Psychological Aspects" in International Encyclopedia of the Social Sciences, Vol. 9, Ed. by David L. Sills, (New York: The Free Press, 1968), pp. 91-100, and Stogdill, p. 5.



The Great Man Theories and Situational or Environmental Theories are viewed by Stogdill as leading to simultaneous consideration of both personal and situational factors.<sup>1</sup> The Great Man Theories, expressed primarily between 1840 and 1935, assumed that individuals have different degrees of psychological and physical traits, that ability to lead depends upon inheritance of unique qualities, and that since leaders possessed distinctive qualities, identification of traits possessed by leaders was possible. Reasoning from these assumptions, and as a consequence of the growth of personality theory and a desire to identify traits that would be useful in making a distinction between leaders and non-leaders, led to expression of theories which explained leadership in terms of personality and character.

Contemporary with the investigation of traits by the Great Man school, the Situational-Environmental school was pursuing a different approach.<sup>2</sup> This school assumed that emergence of great leaders resulted from a combination of time, place and circumstance. It was felt that the type of leadership a group developed, or accepted, depended upon the nature of the group and the problem(s) it had to solve. Reasoning from this assumption led to the thought that leadership did not reside in a person but was in fact a function of the occasion; that the leader did not inject leadership but was the instrument through which leadership was achieved.

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<sup>1</sup>Stogdill, p. 17 and T. O. Jacobs, Leadership and Exchange in Formal Organizations (Alexandria, Va.: Human Resources Research Organization, 1970), pp. 1-5.

<sup>2</sup>Stogdill, p. 18.

Taken as a whole, early research demonstrated that no single trait or pattern of leader behavior characterized all effective leaders; later research demonstrated the strong effect of situational factors on leader emergence, behavior, and effectiveness.<sup>1</sup> The major influences in reaction to early explanations of leadership were Gibb's report of the situational shifting of leadership in small groups and Stogdill's study of the literature of personality traits. These two studies revealed that personality traits which were also leadership traits depended upon the situation and on the requirements of the group. Examination by Stogdill of the extent to which traits differed from situation to situation led him to conclude that it might be more fruitful to consider leadership as a relationship that exists between persons in a social situation, rather than a unique quality of the individual serving as the leader. Stogdill concluded:

A person does not become a leader by virtue of the possession of some combination of traits, but the pattern of personal characteristics of the leader must bear some relevant relationship to the characteristics, activities, and goals of the followers. Thus, leadership must be conceived in terms of the interaction of variables which are in constant flux and change.<sup>2</sup>

The findings of Gibb and Stogdill led to further research discussed in the following section.

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<sup>1</sup>Martin M. Chemers and Robert W. Rice, "A Theoretical and Empirical Examination of Fiedler's Contingency Model of Leadership Effectiveness" in Contingency Approaches to Leadership, Ed. by James G. Hunt and Lars L. Larson (Carbondale, Ill.: Southern Illinois University Press, 1974), p. 94; Cecil A. Gibb, "The Principles and Traits of Leadership," in Journal of Abnormal and Social Psychology, 42 (1947) p. 168; Ralph M. Stogdill, "Personal Factors Associated with Leadership," in Journal of Psychology, 25 (1948) p. 36; Jacobs, p. 9.

<sup>2</sup>Stogdill, "Personal Factors," p. 64, and Gibb, in which Gibb reaches the same conclusion.

### Interaction-Expectation Approach

The principal aspects of interaction theory were stated by Gibb in terms of the purpose of the group, role differentiation, leadership as an interactive phenomenon, and evaluation within the group.<sup>1</sup> Conceptually, leadership was viewed in terms of interaction of two or more persons where the interaction results in the leader controlling the actions of others in pursuit of common goals. The group was perceived as a device used for achievement of individual and group satisfactions simultaneously; and, within the group, the leadership role was seen as the part of the device that propels a group toward its goals and toward satisfaction of members' needs. The group was viewed as having a relatively stable set of expectations for the behavior of each member, with the expectations expressed through interaction among members. The role attained by the individual was viewed as being determined by his personality, ability, and skill and by the functional requirements of the group to meet the situation; the leadership role was viewed as a function of the dynamic interaction of personality and the social system. This view of social interaction gave rise to a number of hypotheses including Fiedler's Contingency Theory, which is discussed in the following section.

### The Contingency Theory

Fred Fiedler's Contingency Theory of leadership effectiveness serves to operationalize the interaction-expectation approach, an approach which recognizes the importance of both situational and personal

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<sup>1</sup>Cecil A. Gibb, "An Interactional View of the Emergence of Leadership," in Australian Journal of Psychology, 10 (1948) p. 103; Gibb, "Psychological Aspects," p. 95.



determinants of leadership effectiveness.<sup>1</sup> The remainder of this section will present a discussion of the Contingency Model which summarizes the theory.

### The Contingency Model

The Contingency Model of leadership effectiveness stems from a comprehensive study of the relationship among three factors: The conditions under which leadership is attempted, the inner needs of the leader, and the success of the group in accomplishing its goals.<sup>2</sup> Fiedler's underlying hypothesis was, "...that the effectiveness of a group depends upon the interaction between the leader's style of relating to his group members and the degree to which the situation enables the leader to exert influence over his group."<sup>3</sup> The model serves to integrate the findings of a fifteen-year program of research into a theoretical framework for understanding leadership effectiveness in an organizational context.

### Underlying Assumptions

Inherent in the development of the model were the underlying assumptions summarized below.<sup>4</sup>

1. An unusually good leader or a best way to lead does not exist.

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<sup>1</sup>Chemers and Rice, p. 94.

<sup>2</sup>Jacobs, p. 62.

<sup>3</sup>Fiedler, Leadership Effectiveness, p. 131.

<sup>4</sup>The underlying assumptions are summarized from Chemers and Rice, pp. 98-99.

2. Different leadership styles are best in different situations, and there is a range of leadership styles to be employed in various situations.

3. Leadership style must be integrated with situational favorableness in order to predict leadership effectiveness. Leadership behavior may change with changes in the situation; the orientation toward group activity as measured through the Least-Preferred-Coworker (LPC) scale (leadership style) is unique in the individual and is relatively unchanging.<sup>1</sup>

4. A selected subset of situational variables is employed to represent the dimension of favorableness to the leader's potential for influence and control. This subset consists of leader acceptance, task structure, and position power.

5. Virtually all variables which affect the leadership position can be subsumed into the favorableness dimension.

#### Dimensions of the Model

Groups found in an organization are classified as coacting, counteracting and interacting, depending on the relationship which develops among group members as a consequence of the tasks which the

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<sup>1</sup>Fiedler states that, "the distinction between leadership style and leadership behavior is critical for understanding the theory . . . leadership behavior of the same individual differs from situation to situation, while the (underlying) need-structure of the individual which motivates these behaviors may be seen as constant.", Leadership Effectiveness, p. 36.

groups perform.<sup>1</sup> Coacting groups are those whose members perform their tasks with relative independence of each other while working toward a common goal. For example, the effectiveness of a retail store may be reflected in terms of the sum of sales of each clerk; yet each clerk acts on his own; and his performance depends on individual ability, skill, and motivation, with reward computed on an individual basis. Counteracting groups are those whose members work together to negotiate and reconcile conflicting opinions and purposes. These groups are typically engaged in negotiating and bargaining processes, with some members representing one point of view and others a divergent point of view; for example, in a new product department where some members represent a manufacturing point of view, others a marketing point of view, and still others a financial point of view. Interacting groups are those whose members work in close coordination in order to achieve group goals. These groups require coordination so that people may perform interdependent tasks sequentially without interruption; for example, in the production of furniture, failure to complete the framework interferes with completion of subsequent work and hence the final product. While most groups are a mixture of all three types, Fiedler used interacting groups as the basis for development of his Contingency Model; accordingly, the dimensions of interacting groups are discussed in the following paragraph.

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<sup>1</sup>Fiedler, Leadership Effectiveness, pp. 17-22 and 234. Fiedler observed that understanding the differences and similarities between these classes of groups was an aid in generalizing from one set of groups to others. For example, his data suggest that coacting and interacting groups with high leader position power require similar leadership styles.



The Contingency Model, in dealing with interacting groups concurrently considers the dimensions of favorableness of the situation, style of leadership and leader effectiveness; it considers different conditions of group support encountered by the leader (favorableness of the situation) in determining the style of leadership which produces the most effective performance.<sup>1</sup> While a major consideration of the current research is style of leadership, a discussion of favorableness of the situation and leader effectiveness is appropriate in order to place style of leadership in an appropriate context.

#### Favorableness of the Situation

Favorableness of the situation, or the degree to which the situation enables the leader to exert influence over his group, was specified by Fiedler in terms of three factors: 1) Affective leader-group relations, 2) Task structure, and 3) Position power.<sup>2</sup> The first factor, affective leader-group relations, reflects the extent to which the leader feels accepted by his group members. The second, task structure, refers to decision verifiability, goal clarity, goal-path multiplicity, and solution specificity. Finally, position power refers to the extent to which the leader may dispense rewards, punishments, and sanctions.<sup>3</sup>

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<sup>1</sup>Jacobs, p. 62.

<sup>2</sup>Fiedler, Leadership Effectiveness, p. 13.

<sup>3</sup>M. E. Shaw, "Scaling Group Tasks: A Method for Dimensional Analysis", (Gainesville, Fla.: University of Florida), 1963. (Mimeographed.)

By dichotomizing each of the factors of situation favorableness into high and low, Fiedler identified eight descriptively different situations, each with its own degree of favorableness. These eight situations are identified below.

TABLE 4  
EIGHT DEGREES OF SITUATION FAVORABLENESS

Situation	Leader-Group Relations	Task Structure	Position Power
1	Good	Structured	High
2	Good	Structured	Low
3	Good	Unstructured	High
4	Good	Unstructured	Low
5	Poor	Structured	High
6	Poor	Structured	Low
7	Poor	Unstructured	High
8	Poor	Unstructured	Low

SOURCE: Terence R. Mitchell et al. "The Contingency Model: Criticism and Suggestions", in Academy of Management Journal, (Sept., 1970), Vol. 13, No. 3, p. 254, and Fiedler, Leadership Effectiveness, p. 142. According to Fiedler, situation one would be most favorable and situation eight would be least favorable for the leader.

### Leadership Effectiveness

The dimension of leadership effectiveness is expressed in terms of group performance on the task assigned to the group.<sup>1</sup> Fiedler holds that the typical group in an organization owes its existence to the task it is assigned to perform and that it will be evaluated primarily on the basis of task performance. A group may perform well on its assigned task and at the same time have low morale or give members little satisfaction; or a group may continually fail to achieve its goals even though morale is high and members well satisfied. He holds that a group which continually fails to complete its task will disintegrate or be disbanded no matter how high the morale or member satisfaction. Accordingly, Fiedler views the leader's effectiveness as measured by the group's performance "...even though the group's output is not entirely a function of the leader's skills"; he recognizes an exception where the explicit task of the leader is to build morale or increase member satisfaction, e.g., where an executive is told to rebuild the morale of a department.<sup>2</sup>

### Style of Leadership

Fiedler's theory postulates two major styles of leadership, a task-oriented style and a relationship-oriented style.<sup>3</sup> The task-oriented style serves to satisfy the leader's need to gain satisfaction

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<sup>1</sup>Fiedler, Leadership Effectiveness, pp. 9-13.

<sup>2</sup>Ibid., p. 9.

<sup>3</sup>Ibid., p. 13.



from performing the task. The relationship-oriented style serves to satisfy the need for position prominence and good interpersonal relations. Measurement of an individual's style is accomplished through use of a relatively simple sociometric instrument for measuring interpersonal perceptions. The instrument, the Least-Preferred-Coworker (LPC) questionnaire, provides an easily accessible, relatively objective means of assessing interpersonal attitudes within a group and provides a means of mapping the interpersonal structure of the group. Style of leadership is determined by asking a subject to think of all the people with whom he has worked and to describe (via the LPC questionnaire) the one with whom he has had the most difficulty getting the job done, i.e., his least-preferred coworker.<sup>1</sup> The score is used as an indicator of leadership style.

Research indicates that the LPC score may be an indicator of the tendency of the individual to perform in a predictable manner. Thus, one who is relationship-oriented, who achieves need satisfaction through good interpersonal relations and is group oriented, is identified as a high-LPC leader. Similarly, one who is task-oriented, who achieves his need satisfaction from the successful accomplishment of assigned tasks and is less concerned with personal relations, is identified as a low-LPC leader.<sup>2</sup> This explanation is not universally accepted. Other

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<sup>1</sup>Fiedler, Leadership Effectiveness, p. 37, and Gibb, "Psychological Aspects," p. 95; Halsey R. Jones and Michael Johnson, "LPC as a Modifier of Leader-Follower Relationships," in Academy of Management Journal, Vol. 15, No. 2, (June, 1972) pp. 185-196.

<sup>2</sup>Jones and Johnson, p. 186, and Fiedler, Leadership Effectiveness, p. 44.

research suggest that LPC scores may be a function of different cognitive styles. Terence Mitchell indicates that ". . . an individual who obtains a high score on the LPC measure must be able to attribute good and bad attributes to the same stimulus person . . . while the low LPC (leader) sees this person as having all bad characteristics."<sup>1</sup> Mitchell feels, therefore, that the LPC score might be related to one's ability to differentiate between various characteristics of a stimulus object. The same predictions about the relationship between LPC and performance are made by both the motivational explanation by Fiedler and cognitive explanation set forth by Mitchell.<sup>2</sup> It remains to be seen if the cognitive interpretation offers any advantages over the motivational interpretation.<sup>3</sup>

#### Summary of the Model

A wide range of leadership situations and working groups was studied by Fiedler between 1951 and 1963. Integration of the results of these studies into a theoretical framework was made possible to a large degree by recognition of task groups as being coacting,

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<sup>1</sup>Terence R. Mitchell, "Leader Complexity and Leadership Style," in Journal of Personality and Social Psychology, (1970), p. 168.

<sup>2</sup>Fred E. Fiedler, "Personality and Situational Determinants of Leader Behavior" in Edwin A. Fleishman and James G. Hunt (Eds.) Current Developments in the Study of Leadership (Carbondale: Southern Illinois University Press, 1973), p. 44; Mitchell, "Leader Complexity," p. 168; Larson and Rowland, "Leadership Style and Cognitive Complexity," p. 45.

<sup>3</sup>Fiedler, Leadership Effectiveness, p. 142-147.

counteracting, or interacting in nature and limiting the initial statement of the theory to interacting groups. These groups were characterized in terms of affective leader-group relations, task structure and position power. The task situations encountered by the group were classified into eight cells. The position of each cell in the classification system was based on the assumption that leadership is an influence process and that each of the dimensions measures one aspect of the situation which determines how much influence the leader has. Ordering the octants in terms of relative favorableness was based on the assumption that the leader-member relationship is the most decisive of the three dimensions; that degree of task structure is next most decisive; and that position power has the least impact.

The data assembled from the many studies were plotted in relation to the eight group-task situations shown in Figure 7. The points on the line are correlation coefficients between the LPC scores and a measure of group performance. The LPC scores were ranked, high to low, and then correlated with a ranking of group performance. Points plotted above the midline serve to indicate that for a given combination of situational variables, groups under a relationship-oriented leader (high-LPC) were more effective than those under a task-oriented leader (low-LPC). Similarly, points plotted below the midline serve to indicate that groups with a task-oriented leader (low-LPC) were more effective than those with a relationship-oriented leader (high-LPC). Thus in situations that are highly favorable or unfavorable (I, II, III, and VIII) task-oriented leaders were found to be more effective; while



in situations of moderate favorableness to the leader (IV, V, and VII) relationship-oriented leaders were found to be more effective.<sup>1</sup>

The relationship among favorableness of the situation, style of leadership, and effective group performance, illustrated in Figure 4, was summarized by Fiedler as follows:

We have presented a theory, the Contingency Model, which states that the group's performance will be contingent upon the appropriate matching of leadership style and the degrees of favorableness of the group situation for the leader, that is, the degree to which the situation provides the leader with influence over his group members.<sup>2</sup>

Fiedler's model expressed a relationship between two leadership styles (task-oriented and relationship-oriented) and eight degrees of situational favorableness (expressed in terms of affective leader-group relations, task structure, and position power) which the leader may encounter; a relationship in which "... the appropriateness of leadership style for maximizing group performance is contingent upon the favorableness of the group task situation."<sup>3</sup> As cited in an earlier chapter, Fiedler expressed the view that it is "... easier to change almost anything in the job situation than a man's personality and his leadership style."<sup>4</sup> A contrasting view holds that the

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<sup>1</sup>Fiedler found no groups to fit combination VI; the curve was simply extended from V to VII. In subsequent research a negative correlation was reported by Walter Hill in "Validation of Fiedler's Theory of Leadership Effectiveness," Academy of Management Journal, (March, 1969), p. 45.

<sup>2</sup>Fiedler, Leadership Effectiveness, p. 151.

<sup>3</sup>Ibid., p. 147.

<sup>4</sup>F. E. Fiedler, "Engineering the Job to Fit the Manager," p. 115.

successful leader is one who determines the "... most appropriate behavior at any given time ... and is ... able to behave accordingly."<sup>1</sup> This difference of views prompted Hill to ask one of the major questions pursued in the current study, i.e., can "... a leader behave flexibly enough to cope with varied situations or, is ... it necessary to replace the leader as the situation changes or to modify the situation to fit the leader's capabilities?"<sup>2</sup>

#### Contemporary Comments on the Contingency Model

Fred Fiedler's investigation started from the generally recognized observation, regarding the situational context in which the leader operates, that "while one form of leadership was associated with effective group performance in one set of circumstances, there were circumstances in which a quite contrary form seemed most effective."<sup>3</sup> From this point of convergence, Fiedler developed the Contingency Model as described in the preceding section of this chapter. The following sections reflect, first, the current points of view regarding the validity of the model and then an examination of the question of leadership style flexibility.

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<sup>1</sup>R. Tannenbaum and W. H. Schmidt, p. 301.

<sup>2</sup>Hill, "Leadership Style," p. 64.

<sup>3</sup>Gibb, "Psychological Aspects," p. 95.

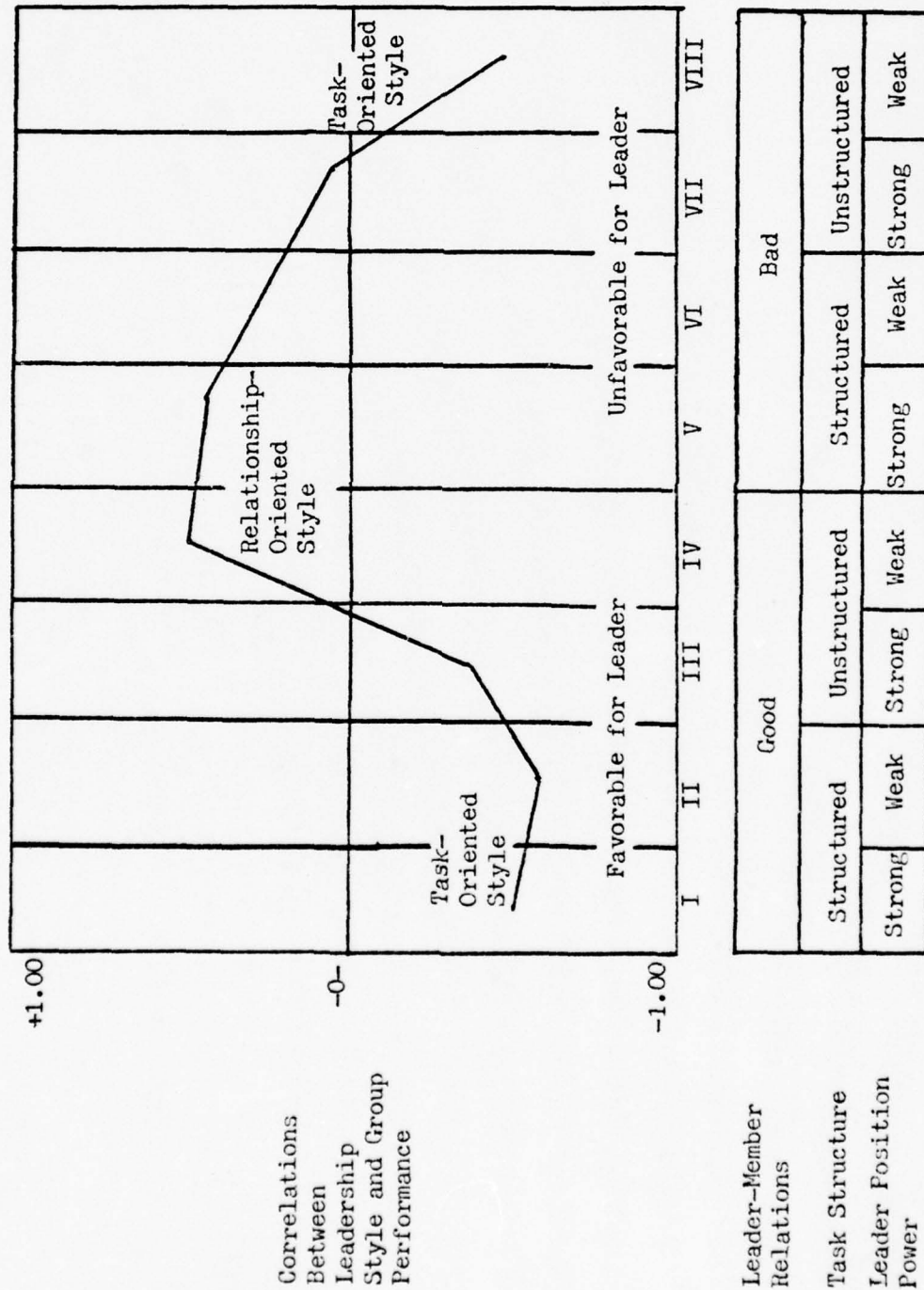


Figure 4. The Contingency Model of Leadership Effectiveness

SOURCE: Adapted from Fiedler, Leadership Effectiveness, p. 131.



## Validity of the Model

The model is susceptible to question because it was based to a large degree on rearrangement of previously collected data. The question of validity is important because the model is accepted by many people and thus has implications both of a theoretical and an applied nature.<sup>1</sup> The discussion of validity is limited to research occurring after promulgation of the theory in 1964 and to research which actually tests the model.

The first empirical test (1967) of the Contingency Model in a bona fide organizational setting was conducted by James Hunt.<sup>2</sup> He studied a total of 89 groups in three different organizations: an atomic energy unit, a grocery chain, and a heavy manufacturing company. His test involved obtaining LPC scores from work unit supervisors; classifying samples into octants according to leader-group relations, task structure, and position power; determining correlations between leader LPC and performance; and testing the correlation observed for statistical significance. All correlations obtained were of approximately the same magnitude and direction of that predicted by the model. Hunt concluded that the model had potential for use in selection and placement of managerial personnel and for use in modifying situational variables to match a manager's leadership style.

Walter Hill, in 1968, conducted studies within an electronic

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<sup>1</sup>Chemers and Rice, p. 100.

<sup>2</sup>J. G. Hunt, "Fiedler's Leadership Contingency Model: An Empirical Test in Three Organizations," in Organizational Behavior and Human Performance, 2 (1967) p. 292.

firm and a hospital to test the validity in 102 groups. He obtained LPC scores for each group leader and measured group performance by a rating prepared by each group leader's superior. His findings tended to ". . . corroborate the model although much more empirical evidence is necessary before the predictability of the model is established sufficiently to warrant its use as a managerial tool in the selection, placement and training of supervisors."<sup>1</sup>

Terence Mitchell, et al., reviewed 25 studies conducted after 1964 which attempted to test the model or various aspects of it.<sup>2</sup> It was found that field studies testing the model in an organizational environment indicated a close relationship between the predicted and actual curve; however, studies stemming from laboratory experiments did not reflect the same close relationship. This suggested caution in assuming that the model may be generalized to the laboratory situation, or that field situations can be reproduced in the laboratory.

Mitchell and his fellow researchers gave primary emphasis to examination of inadequacies in the specification of the situational favorableness dimension. They observed that while reasonably objective means were available for specifying task structure and position power, leader-member relations were typically assessed after the data collection, using a group-atmosphere scaling instrument. They concluded

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<sup>1</sup>Walter Hill, "The Validation and Extension of Fiedler's Theory of Leadership Effectiveness," in Academy of Management Journal, (March, 1969), p. 47.

<sup>2</sup>Mitchell et al., "Contingency Model," pp. 255-56.

that this procedure tended to bias the group atmosphere scores. However, later investigation by Chemers and Skrzypek which replicated earlier research, while independently manipulating leader-member relations, indicated that even though the criticism was justifiable, it had little impact on the validity of the model.<sup>1</sup>

The concept of ranking different combinations of only three variables to obtain eight octants of situational favorableness was deemed unsatisfactory by O'Brien et al.<sup>2</sup> This group of researchers conceived the variables of situational favorableness as a continuum and suggested methods to improve their specification. If these methods were successfully applied, the end points of a spectrum would be defined; the contingency curve would be smoothed; and discrepancies among studies would be reduced.<sup>3</sup> Contingency Model theorists have acknowledged the need to incorporate variables such as stress, linguistics, training experience, leader status, and organization climate into the specification of the favorableness dimension; however, the question of the most effective way to include such variables remains unsettled.<sup>4</sup>

In 1971, Fred Fiedler reviewed a number of laboratory and field experiments which test the model in terms of its traditional parameters

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<sup>1</sup>Chemers and Rice, p. 106; M. M. Chemers and G. J. Skrzypek, "An Experimental Test of the Contingency Model of Leadership Effectiveness," in Journal of Personality and Social Psychology, 24 (1972) p. 176.

<sup>2</sup>G. E. O'Brien, A. Biglan, and J. Perna, "Measurement of the Distribution of Potential Influence and Participation in Groups and Organizations," in Journal of Applied Psychology, 56 (1972) p. 17.

<sup>3</sup>Chemers and Rice, p. 107.

<sup>4</sup>Ibid., p. 108.



and a number which employ other means for specifying the favorableness dimension.<sup>1</sup> Fiedler found, after some reanalysis of data presented, that 75 per cent of the correlations were in the direction predicted by the model. Chemers and Rice commented on Fiedler's conclusion by stating that while the research tends to support the contingency model, support is not unequivocal.<sup>2</sup>

An extensive analysis of the model, made by Graen et al., in 1970, reiterates the criticisms reported above.<sup>3</sup> This research group maintained that the specification of situation favorableness was vague and variable across studies to the extent that only post hoc ordering of data supported the pattern of results reported. Supportive of this point of view, the researchers presented data from two laboratory experiments of their own which failed to support the Contingency Model.<sup>4</sup> They also emphasized dangers in a procedure in which no single study stands the test of the theory and in which the pattern of data of a number of tests when ". . . taken together is judged by criteria far

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<sup>1</sup>F. E. Fiedler, "Validation and Extension of the Contingency Model of Leadership Effectiveness: A Review of Empirical Findings," in Psychological Bulletin, 76 (1971) p. 147.

<sup>2</sup>Chemers and Rice, p. 101.

<sup>3</sup>G. Graen, D. Alvares, J. B. Orris, "The Contingency Model of Leadership Effectiveness: Antecedent and Evidential Results," in Psychological Bulletin, 74 (1970) pp. 185-195.

<sup>4</sup>G. Graen, J. B. Orris, and K. M. Alvares, "Contingency Model of Leadership Effectiveness: Some Experimental Results," in Journal of Applied Psychology, 55 (1971) p. 199; G. Graen, J. B. Orris and K. M. Alvares, "Contingency Model of Leadership Effectiveness: Some Methodological Issues," in Journal of Applied Psychology, 55 (1971) p. 209.

less stringent than those normally used in scientific inquiry."<sup>1</sup>

Fiedler's response to the criticism posed by Graen et al., focused on the inadequacy of their experimental test and methodology.<sup>2</sup> However, the question of validity of the model remained. Chemers and Skrzypek conducted a carefully controlled experimental test of the full eight-cell model at the United States Military Academy using cadets at that institution.<sup>3</sup> The methodology and positive results of this experiment afforded powerful support for the contingency model curve; lent further credence to the validity of the model; and indicated the general usefulness of experimental studies of leadership.<sup>4</sup>

Walter Hill expressed the thought that while it is not reasonable to claim that the Contingency Model represents an operational statement of a theory of leadership effectiveness, it is clear that existing leadership knowledge is being integrated.<sup>5</sup> Supportive of this viewpoint, he observed that researchers recognize, first, that a truly predictive theory must integrate the various approaches such as traits, roles, functions, situations, or styles; and, secondly, that no one style of leadership behavior (style) is always appropriate; and

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<sup>1</sup>Chemers and Rice, p. 102.

<sup>2</sup>F. E. Fiedler, "A Note on the Methodology of the Graen, Orris, and Alvares Studies Testing the Contingency Model," in Journal of Applied Psychology, 55 (1971) p. 202; and F. E. Fiedler, "Validation and Extension of the Contingency Model," in Psychology Bulletin, 76 (1971) p. 128.

<sup>3</sup>Chemers and Skrzypek, pp. 172-177.

<sup>4</sup>Chemers and Rice, p. 104.

<sup>5</sup>Hill, pp. 63-64.

that successful behavior is contingent upon the situation. Hill perceived a growing acceptance in managerial and academic circles of a Contingency Model which holds that different leadership behaviors are required in different situations in order to achieve effectiveness. One of the questions that arises with acceptance of a Contingency Model is whether ". . . a leader can behave flexibly enough to cope with varied situations, or whether it is necessary to either replace the leader as the situation changes or to modify the situation to fit the leader's capabilities."<sup>1</sup> T. O. Jacobs posed the same question when he asked how flexible the leader is with regard to his group-directed behavior. He feels that interpersonal competence skills possessed by the leader imply flexibility on the part of the leader in responding to the group situation.<sup>2</sup> The following section presents a discussion of leadership style which serves as a prelude to a final section on leadership style flexibility.

#### Leadership Style

Much of the importance attributed to leadership stems from the presumed effect of a leader's behavior on his subordinates' performance and job satisfaction.<sup>3</sup> Leadership style studies conducted by K. Lewin and R. Lippert raised a question about the degree to which the leader

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<sup>1</sup>Ibid., p. 64.

<sup>2</sup>Jacobs, p. 63.

<sup>3</sup>Charles N. Greene, "A Longitudinal Analysis of Relationships Among Leader Behavior and Subordinate Performance and Satisfaction," in Academy of Management Proceedings, Ed. by Thad B. Green and Dennis F. Ray (August, 1973), p. 433.



should be primarily concerned with success of the group versus the degree to which he should be primarily concerned with interpersonal relations within the group.<sup>1</sup> R. F. Bayles, based on his observation of problem-solving groups suggested that complementary leaders, task and socio-emotional specialists, are common to all groups; the former being concerned with solving problems at hand and the latter with maintaining positive interpersonal relations.<sup>2</sup> J. E. McGrath, in a summary of the literature, identified four clusters of leadership behavior (style) as having been the focus of most psychological research in the area. These clusters have been variously labeled as autocratic versus democratic, authoritative versus equalitarian, initiating versus considerate, and task-oriented versus relationship-oriented.<sup>3</sup>

Fiedler employed the latter pair of terms when he postulated two major styles of leadership. The style that fulfills the leader's need to gain satisfaction from performance of a task was termed task-oriented. The relationship-oriented style was the style which satisfied the leader's need to obtain satisfaction by achieving good interpersonal relations and by attaining a position of prominence. Fiedler related low-LPC scores with the task-oriented leader, high-LPC scores with the

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<sup>1</sup>K. Lewin and R. Lippert, "An Experimental Approach to the Study of Autocracy and Democracy: A Preliminary Note," in Sociometry, 1 (1938) pp. 292-300.

<sup>2</sup>R. F. Bayles, "Task Roles and Social Roles in Problem Solving Groups," in Readings in Social Psychology, Ed. by Eleanor E. MacCoby, T. M. Newcomb, and E. L. Hartley (New York: Holt Rinehart and Winston, Inc.), 1958, p. 441.

<sup>3</sup>J. E. McGrath, A Summary of Small Group Research Studies, HSR-TN-62/3-6N (Arlington, Va.: Human Sciences Research, Inc.), 1962.

relationship-oriented leader and attributed behavior to the needs perceived by individual leaders.<sup>1</sup>

Research supports the view that the LPC score is an indicator of the tendency of the individual to behave in a predictable manner. Hill suggested that the variation in LPC scores might be a function of different cognitive styles rather than the underlying need structure of the individual.<sup>2</sup> This point of view was examined by Mitchell who explained the relationship between cognitive differentiation and LPC in the following manner:

An individual who obtains a high score on the LPC measure must be able to attribute both good and bad attributes to the same stimulus person (i.e., the favorable end of each scale has the higher score). In other words, a high LPC subject (very few subjects are extremely high—all positive ratings) must see his least-preferred coworker as having some good characteristics, while the low LPC subject sees this person as having all bad characteristics. This sort of approach suggested that perhaps the LPC score might be related to such concepts as stereotyping, response sets, and one's ability to differentiate between various characteristics of a stimulus object.<sup>3</sup>

The suggestion by Hill that the variation in LPC scores might be related to cognitive complexity was also examined by Lars Larson and Kendrith Rowland in a later study.<sup>4</sup> They examined the possibility that a high-LPC leader perceives more differences in the environment,

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<sup>1</sup>Fiedler, Leadership Effectiveness, pp. 12-14.

<sup>2</sup>Walter Hill, "The LPC Leader: A Cognitive Trust," in Academy of Management Proceedings, (1969), pp. 125-130.

<sup>3</sup>Terence R. Mitchell, "Leader Complexity and Leadership Style," Journal of Personality and Social Psychology, 16 (1970), p. 166.

<sup>4</sup>Lars L. Larson and Kendrith M. Rowland, "Leadership Style and Cognitive Complexity," in Academy of Management Journal, Vol. 17, No. 1, (March, 1974), pp. 37-45.

is more likely to view others in ambivalent terms, and is better able to assimilate contradictory cues as compared to a low-LPC leader who perceives categorical black-white situations. These researchers were unable to establish a relationship between LPC score and cognitive complexity as suggested by Hill and concluded that Fiedler's findings of differential behavior between high and low LPC leaders are ". . . more likely to be explained by the underlying need structure of high and low LPC individuals than by the ability to be more accurate or skilled in perceiving the situation."<sup>1</sup>

It has been observed that the Contingency Model implies that the relationship between criteria such as employee performance or satisfaction and style of leadership (LPC scores) is significantly influenced by the situation.<sup>2</sup> Research indicates that gratification comes not because the activity leads to or is instrumental to other satisfactions (such as more money), but because the activity is, of itself, gratifying.<sup>3</sup> This motivational pattern has to do with the situation provided for the expression of skills and talents by the individual. While there is probably no single "correct relationship" between satisfaction and performance, in some instances relationships

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<sup>1</sup>Ibid., p. 45.

<sup>2</sup>Richard N. Osborne, James G. Hunt and Richard Pope, "Lateral Leadership, Satisfaction and Performance," in Academy of Management Proceedings, Ed. by Thad B. Green and Dennis F. Ray, (August, 1973), p. 441.

<sup>3</sup>Daniel Katz, "The Motivational Basis of Organizational Behavior," in Readings in Organization Theory: A Behavioral Approach, Ed. by Walter A. Hill and Douglas Egan (Boston: Allyn and Bacon, Inc., 1966), p. 120; and Victor H. Vroom, Work and Motivation (New York: John Wiley and Sons, Inc., 1964), pp. 128-129.



have been noted. For example, those subordinates rated highest in performance tend to have values similar to their supervisors; and the better educated and more affluent the work force becomes, the greater emphasis there will be on satisfaction of higher order needs; i.e., the degree of job satisfaction may be related to occupational differences in norms with respect to the work.<sup>1</sup> These observed instances imply the need for discrimination in applying leadership styles to occupational groups and situations. The following section provides a discussion of leadership style flexibility, i.e., whether a leader can behave flexibly enough to cope with various situations.

#### Leadership Style Flexibility

The contingency approach toward explaining leadership effectiveness holds that different leadership behaviors are required to different situations in order to achieve group effectiveness. There is a question, however, as to whether a leader can behave flexibly enough to cope with various situations, i.e., how flexible can the leader be with respect to his group-directed behavior? The differing points of view regarding a response to this question will be discussed in the following section. This will be followed by a discussion of the leadership style flexibility research performed by Walter Hill.<sup>2</sup>

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<sup>1</sup>John P. Wanous, "A Causal-Correlational Analysis of the Job Satisfaction and Performance Relationship," in Academy of Management Journal Proceedings, Ed. by Thad Green and Dennis Ray, (August, 1973), p. 432.

<sup>2</sup>Hill, p. 64.

The Points of View

Fred Fiedler holds that the needs underlying the attitudes reflected in LPC scores (leadership style) are enduring characteristics of the individual, and, that individuals have only limited capacity for change, such as altering their responses to changing situations.<sup>1</sup> He suggests that it might be appropriate for organizations to engineer positions so that their requirements match the capacities of available leaders rather than to train personnel to fit the leadership requirements of existing positions. He stated that:

Fitting the man to the leadership job by selection and training has not been spectacularly successful. It is surely easier to change almost anything in the job situation than a man's personality and his leadership style.<sup>2</sup>

T. O. Jacobs emphasizes the importance of leadership style flexibility. He holds that flexibility of the leader's response to the group situation (in order to obtain desired response from group members) implies use of interpersonal competence skills by the group leader.<sup>3</sup> Within groups he perceives two broad types of leader roles: Task-oriented and socio-emotional-oriented and holds that the two types of leader roles result from the fact that groups have two broad categories of needs or objectives. One category stems from the need to achieve group objectives and thus continue group existence. The other category stems from individual member need for socio-emotional contact

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<sup>1</sup>Jacobs, p. 63.

<sup>2</sup>F. E. Fiedler, "Engineer the Job to Fit the Manager," p. 115.

<sup>3</sup>Jacobs, p. 63.

with other people. The significance of the two types of leader roles, and the needs from which they arise, is underscored by his observation that a leader possessing great role enactment (style) flexibility ". . . will be endorsed more strongly by his group than a leader who is limited . . . either to task specialization or social specialization."<sup>1</sup>

Robert Tannenbaum and Warren Schmidt view leaders as possessing style flexibility. They hold that effective leaders identify those factors which have importance in a situation and act in accordance with their perceptions.<sup>2</sup> They suggest that a leader is capable of exhibiting a wide range of behaviors; that the successful leader is able to behave according to the needs of different situations.

They state that:

The . . . successful leader is one who is keenly aware of those forces which are most relevant to his behavior at any given time. He accurately understands himself, the individuals, and the group he is dealing with, and the company and broader social environment in which he operates. . . . (He) is one who is able to behave appropriately in the light of these perceptions.<sup>3</sup>

#### The Research

Divergence in points of view served as the departure point for a study of leadership style flexibility by Walter Hill.<sup>4</sup> His

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<sup>1</sup>Ibid., p. 66.

<sup>2</sup>R. Tannenbaum and W. H. Schmidt, pp. 95-101.

<sup>3</sup>Ibid., p. 101.

<sup>4</sup>Walter A. Hill, "Leadership Style Flexibility, Satisfaction, and Performance," in Current Developments in the Study of Leadership, Ed. by Walter A. Fleishman and James G. Hunt (Carbondale, Ill.: Southern Illinois University Press, 1973), pp. 62-83.



objective was ". . . to learn whether subordinates perceive their leaders using the same style of leadership for a variety of problems or whether they perceive their leaders altering their styles as they are confronted with different situations."<sup>1</sup> An additional purpose was to investigate possible relationships between leadership style flexibility and both employee performance and job satisfaction. For the purpose of his study, Hill defined leadership style flexibility as the subordinate manager's perceptions of the degree to which superiors would use different leadership styles in different situations.<sup>2</sup>

The methodology involved asking respondents to indicate the extent to which leaders employed interpersonal and task competence skills. Each respondent was presented with four managerial styles and asked to choose the style his superior would use to solve each of four problems (two task and two interpersonal) with different degrees of complexity. The choice of four styles associated with four situations permitted identification of five degrees of leadership style flexibility. These styles ranged from rigid (the same style used for all situations) to flexible (a different style used in each situation).<sup>3</sup> Additionally, superiors were asked to report on the effectiveness of

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<sup>1</sup>Ibid., p. 65.

<sup>2</sup>Hill did not make actual measurements of supervisory behavior. He assumed that subordinates would indicate the style their supervisors would employ in similar real situations, since respondents were asked how supervisors would respond to four hypothetical, but typical managerial problems.

<sup>3</sup>The five styles are described in Figure 3, Chapter I. The quantitative results of Hill's study are summarized in Appendix B.

performance of their subordinate manager, and all respondents were asked to indicate their level of satisfaction with their work situation.

It was found that subordinate managers in Hill's sample believed their superiors would vary leadership style as the situation changed regardless of whether these managers were at the first or middle management level. Results indicated that the type of problem confronting a manager does influence his choice of leadership style.<sup>1</sup> Hill interpreted his data to mean that subordinates frequently see their superiors as tending to adopt a fairly consistent leadership style toward a set of problems of one type, but then vary leadership style toward other types of problems. It was also found that perceived leadership style flexibility was not directly related to managerial performance but was related to job satisfaction.

The results of the study did not prove that managers actually use different styles for different problems because such proof would require direct observation of leadership behavior; results did indicate, however, that subordinates perceived that their superiors would use different styles.<sup>2</sup> Hill felt that the results justified a conclusion that the managers participating in the study exhibited considerable style flexibility; a conclusion which, if found to be generally applicable, would obviate the limitation either to replace the manager as the situation changes or to modify the situation to fit the leader's capabilities.

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<sup>1</sup>Hill, "Leadership Style," p. 79.

<sup>2</sup>Ibid., p. 80.

As indicated above, Hill observed a tendency for subordinates to report that their superiors would use one style to handle interpersonal problems and a different style for technical problems. He felt that leaders might adopt a consistent response pattern toward certain types of problems and not for others because these leaders develop a good deal of confidence and experience little anxiety when confronted with certain types of problems, while other types make them uncertain and insecure.<sup>1</sup> He suggests that the style employed by a manager may reflect his hierarchy of goals; i.e., the individual seeks to achieve his primary as well as his secondary goals in situations which are favorable and his influence is relatively great but will concentrate on securing only primary goals in situations which are unfavorable and stressful.<sup>2</sup> This interpretation suggests that a leader varies style with the situation as it becomes more or less easy for him to exert influence so as to achieve his goals.

The major purpose of the research was to determine if subordinates perceived that superiors would use the same leadership style, irrespective of which style, for each of four hypothetical problems. The great majority of respondents replied that their superiors would exhibit some degree of style flexibility across the four situations, thus suggesting that a leader is capable of exhibiting a range of behaviors. The usual caveat regarding conclusions drawn from a study of a single population obviously applies here. Replication among

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<sup>1</sup>Ibid., p. 81.

<sup>2</sup>Ibid., p. 80.



different samples, such as the current study, is necessary before any attempt at generalization can be made.

### Summary

A search of the literature was undertaken to: 1) describe the contingency approach as it evolved from the extensive and general literature of leadership, 2) focus upon where the Contingency Model fits in the pattern of theoretical examination of leadership phenomena, and 3) examine a selected group of previous studies devoted to examination of leadership style and to leadership style flexibility.

According to Stogdill, leadership research fits into six categories: 1) Great Man Theories, 2) Situational or Environmental Theories, 3) Personal-Situational Theories, 4) Interaction-Expectation Theories, 5) Humanistic Theories, and 6) Exchange Theories. Contemporary research can be traced to the Personal-Situational Theories which represent an amalgam of the Great Man and Situational or Environmental Theories. The Interaction-Expectation approach is of particular interest because the view of social interaction expressed gives rise to a number of hypotheses including Fiedler's Contingency Model.

Fred Fiedler's Contingency Model of leadership effectiveness serves to operationalize the Interaction-Expectation approach. The Contingency Model considers the conditions under which leadership is attempted, the inner needs of the leader, and the performance of the group in accomplishing its goals. The degree to which the situation enables the leader to exert influence over his group (favorableness of the situation), group performance as a measure of the leader's

effectiveness, and style of leadership are the dimensions of the model. An important relationship within the model is that leadership style must be integrated with situational favorableness in order to predict leadership effectiveness. An underlying assumption is that leadership behavior may change with changes in the situation; but the orientation toward group activity as measured through the LPC scale (leadership style) is central to the individual and is relatively unchanging.<sup>1</sup> Fiedler views LPC scores as being representative of the inner needs of the subject, while Mitchell views LPC scores as representing different cognitive styles. Both writers agree upon the same interpretation about the relationship between LPC and performance, i.e., high-LPC persons are relationship-oriented while low-LPC persons are task-oriented.

The validity of the Contingency Model has been challenged primarily because it was based to a large degree upon rearrangement of previously collected data. Walter Hill and James Hunt conducted separate empirical tests of the model in operating organizations and concluded that the model had potential for use in selection and placement of managerial personnel and for use in modifying situational variables to match a manager's leadership style. Terence Mitchell,

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<sup>1</sup>There is a distinction between leadership style, which refers to the underlying need-structure of the individual and which motivates his behavior in various leadership situations, and leadership behavior, which refers to the particular acts in which a leader engages in the course of directing and coordinating group member activity, e.g., showing consideration for their feelings, according to Fiedler, Leadership Effectiveness, p. 36.

et al., reviewed over two dozen studies made subsequent to announcement of the Model in 1964, and discovered that those tests made in an organizational environment indicated a close relationship between the predicted and actual curve, while tests made under laboratory conditions did not reflect the same close relationship. O'Brien, et al., suggested methods to improve specification of the variables associated with the situational favorableness dimension, a recognized but as yet unsatisfied need. Graen and associates went beyond O'Brien, et al., and maintained that specification of situation favorableness was vague and variable across studies to the extent that only post hoc ordering of data supported the pattern of results reported. The results of a carefully controlled experimental test of the full eight-cell model conducted by Chemers and Skrzypek, in response to the observations of Graen, et al., were supportive of the validity of the Model.

Walter Hill observed that researchers recognize first that a truly predictive theory must integrate the various approaches such as traits, roles, functions, or styles; and second, that no one style of leadership behavior (style) is always appropriate, that successful leadership behavior is contingent upon the situation. Accordingly, he expressed the thought that while it is not reasonable to claim that the Contingency Model represents a generally accepted operational statement of leadership effectiveness, it is clear that existing leadership knowledge is being integrated. T. O. Jacobs and Walter Hill pose a question that arises with the acceptance of the Contingency Model, viz., Can a leader behave flexibly enough to cope with varied situations?



Research by K. Lewin and R. Lippert, R. F. Bayles, and J. E. McGrath all identified two common modes of leadership style in the groups studied. Fiedler associated these two styles, which he termed task-oriented and relationship-oriented, with an indicator of the tendency of the individual to behave in a predictable manner (LPC score). While it has not been established definitively that either underlying need structure or cognitive complexity explains the meaning of LPC scores, researchers accept that there is a differential of behavior between high and low LPC leaders.

Flexibility of leadership style was examined by Walter Hill in an attempt to determine if leaders can behave flexibly enough to cope with varied situations. Fiedler feels that changing a man's personality and leadership style is impractical; Tannenbaum and Schmidt, and Jacobs disagree. The divergence in points of view served as the departure point for Hill's research which suggested that a leader is capable of exhibiting a range of behaviors.

This chapter dealt with a review of research literature bearing on the problem of leadership style and its flexibility. The evolution of the contingency approach to leadership, the Contingency Model of leadership effectiveness, the validity of the Model, leadership style, and the flexibility of leadership style each was discussed. The review of the research on flexibility of leadership style conducted by Walter Hill revealed that participants in his study exhibited considerable style flexibility. The following chapters are devoted to

describing the research employed in the current study on style flexibility, reporting the findings, and comparing the results to Hill's conclusions. The next chapter describes the selection of an organization, the selection of participants in the field study, development of the questionnaire, and the statistical approach employed. Findings related to each of the research questions are presented in later chapters.

## CHAPTER III

### RESEARCH METHODOLOGY

#### Introduction

The purpose of this chapter is to describe the selection of the field research site, the selection of managers for participation in the study, and the development of the questionnaire and other research tools. The topics to be discussed include the process of selecting the test organization, the preparation of questionnaire, the tabulation of responses, the gathering of data from the reports, and the statistical approach used.

#### Process of Selecting an Organization

Three criteria were established to guide the selection of an organization for the field research portion of the study. The first concerned the size of the management group in the organization to be studied. Since the methodology replicated that employed by Hill, a group of approximately the same size was desired. Further, the minimum size had to be large enough to avoid distortion by extreme views. For these reasons an organization with between one hundred and two hundred managers was sought.

The second criterion was that the management group should include at least three scalar levels of management. This condition was made necessary by the methodology which required superiors to make



a performance evaluation of subordinate managers. Thus, while participation of first and middle levels was needed to allow testing for differences among scalar levels (as in the methodology used by Hill), participation of the upper echelon was also needed to evaluate the performance of middle managers reporting to top management.

The third criterion was that the organization have a mission similar to that studied by Hill, i.e., have a research and development mission. Participants in Hill's study were chosen from two large manufacturing concerns located in the Midlands, England. The great majority of participants was professional and technical managers engaged in research and development, and the smaller part of the group was managers of accounting functions. Similarity in mission between the organizations studied was necessary because mission determined the nature of work that must be performed, in this case research and development. In both Hill's study and in the current study research and development work was the dominant factor in determining the numbers, skills, and educational background of both subordinates and leaders needed to accomplish the mission. Additionally, the nature of the work influenced the task and interpersonal skills needed by organizational members.

#### Selection of the Organization

During the latter part of 1974, The Office of the Provost, Graduate Studies and Research, Florida State University, and the Chief of Naval Education and Training Support, United States Navy, entered into an agreement.<sup>1</sup> The agreement involved research projects which were

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<sup>1</sup>Correspondence pertaining to this agreement is included as Appendix C.

of mutual interest to both participants. The nature of the agreement was such that the Navy agreed to make in-house resources available to qualified doctoral candidates who were undertaking a research project which had a potential to produce useful data for development of training policy or improvement of training management. This arrangement made a United States Navy organization of special interest for this study because of its integral research and development organizations and its continuing interest in the subject of leadership.

In April, 1975, after approval of a preliminary study proposal by his dissertation committee, the writer requested the Chief of Naval Education and Training Support to provide assistance in the proposed study. Naval personnel agreed to participate and suggested the Naval Training Equipment Center as a research-and-development oriented organization that appeared to meet the study criteria. The writer's request for assistance was confirmed by correspondence dated 17 and 29 April, 1975.<sup>1</sup> As a consequence of these actions, a meeting to establish a point-of-contact within the Naval Training Equipment Center was arranged for May 6, 1975. This meeting will be described later.

#### The Naval Training Equipment Center

The Naval Training Equipment Center (NTEC) is a United States Navy facility operating in Orlando, Florida, and provides service to the Navy worldwide. The organization employed 704 civilians and 59 naval personnel. The Center, operating under the direction of the Chief of Naval Training and Education Support, had a multi-million dollar mission-

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<sup>1</sup>This correspondence is included as Appendix D and Appendix E.

oriented budget in 1975. It had five levels of management and a management staff of 149 personnel, of whom 10 were naval personnel and 139 were civilians; a situation which duplicated the number of management levels and approximated the number of managers (167) in the Hill study.

#### The Center Mission

The mission of the Center was an important consideration because the mission determined the nature of the work that had to be performed. The work to be done determined what talent was required for its performance, i.e., the numbers and types of managers and subordinates needed. The stated mission of the NTEC was:

To contribute to the Navy's operational readiness by improving the effectiveness of the naval training and training material support programs by research, design, development, test, evaluation, procurement, fabrication, maintenance, alteration, conversion, repair, overhaul, logistic support of training devices, equipment and assigned training material.<sup>1</sup>

Implementation of the mission involved performance of the following functions: 1) analysis of training systems, 2) research and technology for training equipment, 3) engineering development and acquisition, 4) preparation of financial plans and budgets, 5) negotiation and administration of contracts with industry for research, development, production and technical services, and 6) logistic support to an inventory management of naval training equipment requirements.<sup>2</sup>

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<sup>1</sup>U. S., Department of the Navy, Organization Manual (Orlando, Florida: Naval Training Equipment Center, 1973), p. 113.

<sup>2</sup>Ibid, pp. 114-120.

## Structure of the Organization

The NTEC had a line-staff structure modified by a matrix arrangement that permitted a program management approach to mission accomplishment. At the level immediately below the Commanding Officer, the activities were assembled in a line-staff pattern of functional groups under department managers. These managers had authority and responsibility for accomplishment of discipline-oriented activities through subordinate division, branch, and section managers.<sup>1</sup> The Director, Plans and Programs, served as the focus of a matrix structure which emphasized the integrative needs of multi-discipline programs, permitted program managers to exercise direct vertical authority over vital facts of programs, and permitted interaction with department managers who exercised line authority in the functional areas. The overall organizational relationships are illustrated in Figure 5; further organizational details are presented in Appendix F and Appendix G.

Both single-discipline and multi-discipline types of work of varying degrees of urgency were generated in the fulfillment of the mission. Single-discipline tasks were planned for and controlled by department managers operating within the vertical pattern of people and physical resources that constituted the line-staff structure. The skills and resources needed for multi-discipline programs were assembled from the departments and placed under program managers, for the duration of the program, to form a matrix structure. The focus of the matrix structure was the Director, Plans and Programs, who identified, planned for, and controlled multi-disciplinary work. He had authority and responsibility

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<sup>1</sup>Ibid., pp. 1-11.



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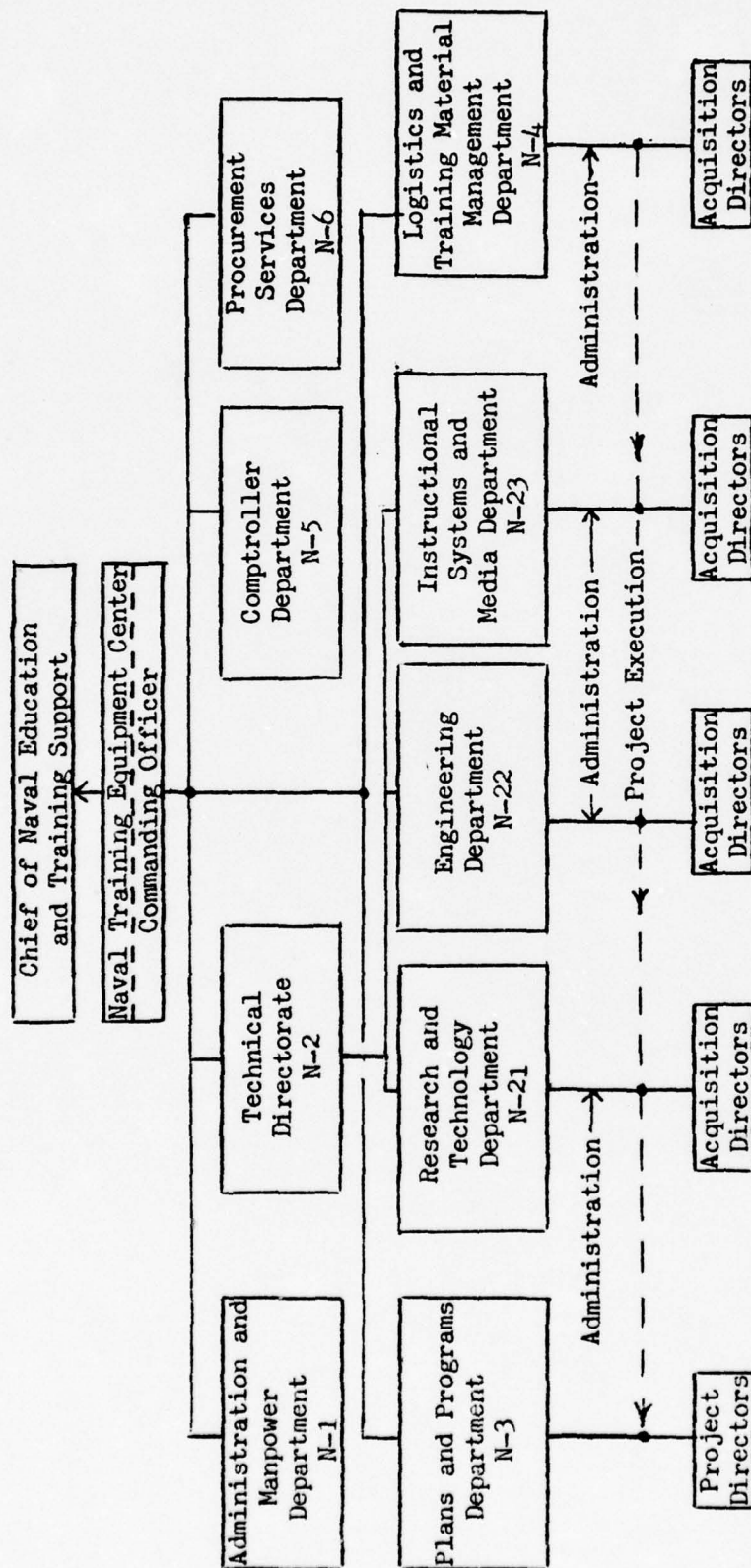
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SOURCE: Adapted from: U. S., Department of the Navy, Organization Manual (Orlando, Florida: Naval Training Equipment Center, 1973).

**NOTE:** The notation N-1, N-2, etc., refers to the shorthand code designation of each organizational element, for example mail addressed to N-2 would go the the Technical Directorate.

Figure 5. Functional Organization, Naval Training Equipment Center

for the accomplishment of multi-discipline programs through program managers designated as project or acquisition directors, depending upon the urgency of the work.<sup>1</sup> Project Directors were designated by the Commanding Officer; Acquisition Directors were designated by department managers and approved by the Director, Plans and Programs. The program managers had authority and responsibility for completion of their programs through subordinate program-group members skilled in the needed functional disciplines. Managers from both the line-staff and matrix elements of the Center organization were participants in this study.

#### Personnel

There were 763 people working in the NTEC at the time of the study. The 763 people consisted of 704 civilian employees of the Navy and 59 Naval personnel. Only 10 Naval personnel occupied managerial positions, the remaining 139 managers were civilian employees.

The solution of the complex problems associated with mission accomplishment required the utilization of a wide variety of professional and technical skills. Managers supervised activities ranging from program analysis, logistics, procurement, financial management and personnel administration to technical work such as that performed by electronic and audio-visual technicians to professional tasks carried out by physiologists, physicists, psychologists, and engineers. Approximately one-half of the managers were engineers with specialties in aerodynamics, systems and electronics. More than 95 per cent of the

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<sup>1</sup>Program managers were designated as Project Directors of the program that required special priority, and as Acquisition Directors of the program that required only normal attention.

respondents had some college education; two-thirds possessed a degree; one-third an advanced degree; and three per cent were qualified at the doctoral level.

### The Questionnaire

The questionnaire used in this study consists of five instruments, each having qualities of validity, reliability, and utility stemming from test and use by others prior to this study. The instruments were assembled into a questionnaire booklet designed to be self-explanatory and easily read. This was essential since it was to be mailed to and completed by the respondent without outside assistance. All necessary instructions were included in the body of the questionnaire and arranged in a logical order. Due to the nature of the study, questionnaires sent to participants varied in length from six to twelve pages.

The complete questionnaire booklet, as used in the study, is shown in Appendix A. Each page is "boxed off" all around and each instrument is grouped with its associated instructions. This was done to enhance eye appeal, to emphasize logical order, and to make it convenient for the respondent.

### General Information

The first page contained instructions for completion of the questionnaire. These instructions were followed by questions concerning the respondent's age, and the level of formal educational achievement. Names were not asked for in order to preserve the anonymity of the individual, an assurance to respondents that their responses would not be divulged to their superiors. The lower left corner of the first page was coded with an (M), for middle managers or an (F) for first-line managers.



### Leadership Flexibility Instrument

The second and third pages contained the Leadership Flexibility Instrument. It was designed by Hill to determine the degree of leadership flexibility that subordinates ascribe to superiors. The Leadership Flexibility Instrument was arranged so that instructions appeared on the left page and the questions to be answered appeared on the opposite page. The instructions included descriptions of four different leadership styles available for use by a supervisor. Respondents were instructed to indicate which of the four styles their immediate supervisor would use to solve each of four different problems described on the answer sheet. Respondents were asked to circle one of four letters associated with the four leadership styles.

### Least-Preferred-Coworker Instrument

The fourth and fifth pages contained the Least-Preferred-Coworker Instrument which was designed by Fiedler to measure leadership style.<sup>1</sup> The instrument was arranged so that instructions appeared on the left page and the questions to be answered appeared on the right page. The instrument was a semantic differential device containing sixteen bipolar adjective items. Each of the items was scored by a range of numbers from eight (at the most favorable pole) down to one (at the least favorable pole). Respondents were asked to think of the person with whom they work least well and to describe the person by placing an "X" in one of the eight spaces between the bipolar adjectives. The scores were interpreted as representative of a relationship-orientation or a task-orientation of the respondent.

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<sup>1</sup>Fiedler, Leadership Effectiveness, pp. 34-37.

### Leader Satisfaction Instrument

The sixth page contained the Leader Satisfaction Instrument, termed the Job Descriptive Index (JDI) by Smith, Kendall and Hulin who developed it.<sup>1</sup> The instrument was designed to measure a subordinate's satisfaction with the supervision he received. The instrument was arranged on a single page with instructions at the top and the questions to be answered below. The instrument contained a list of eighteen adjectives and short phrases. Each respondent was asked to indicate whether each word or phrase applied to his job situation. If a word or phrase described the type of supervision received, he was asked to place a "Y" (yes) in the space provided; if the word or phrase did not describe the type of supervision received he was asked to place an "N" (no) in the space provided; and, if the respondent could not decide, he was asked to place a question mark in the space provided. Using the key described in Table 3 (presented in Chapter I), the scores were interpreted to indicate the respondent's level of satisfaction with the leadership received.

### Performance Evaluation Device

The performance evaluation device consisted of two separate instruments on a single sheet. It was sent only to middle managers (managers who had subordinate managers accountable to them). The upper right-hand corner of each sheet had the handwritten notation: "Please evaluate Mr. \_\_\_\_\_. Detach this corner when complete." The first instrument (Part I, i.e., the upper half of the page) was the instrument used by Hill in his study. The second instrument

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<sup>1</sup>Smith, Kendall, and Hulin, pp. 69-85.

(Part II, i.e., the lower half of the page) was an abridgment of the Field Grade Officer's Effectiveness Report, Air Force Form 707.

The first instrument presented the respondent with a composite index consisting of simple indexes of six criteria considered by Hill to be important to management effectiveness. Instructions asked the respondent to rank the criteria presented in order of importance to the assignment of the individual. He was asked then to evaluate how well the individual performed with respect to each criterion by placing an "X" in one of a series of boxes ranging from unsatisfactory to outstanding. This instrument was used because it met the replicative needs of the current study.

The second instrument presented the respondent with seven sets of statements which possessed equal-appearing intervals descriptive of performance for each of eight different rating factors (criteria). The respondent was asked to evaluate the same individual by placing an "X" in the box near the appropriate description for each rating factor. This instrument differed from the one employed by Hill in that for each rating factor the evaluator was presented with a series of brief descriptions and asked to match the performance of the individual with the appropriate description. This instrument was selected because it presented a meaningful continuum developed with verbal statements for each rating factor, a characteristic unlike the composite index of the instrument developed by Hill. It was also selected because, as an instrument employed in an organizational environment, it provides a basis for comparison of results obtained from the two instruments.



Meetings With the NTEC

On May 6, 1975, the writer met with representatives of the Naval Training Equipment Center (NTEC) as suggested in a letter from the Chief of Naval Education and Training Support, dated April 29, 1975.<sup>1</sup> The purpose of the meeting was to establish a point-of-contact within NTEC for the study and to discuss the NTEC organization, the questionnaire, and survey procedures. A management analyst, assigned to the Administration and Manpower Department, who had been involved in other personnel surveys at the NTEC, was designated as survey coordinator. He fulfilled his task with skill and considerable helpfulness to the writer.

At this meeting the writer acquired documents which provided valuable personnel and organizational information and which delineated policy and procedures relating to project and acquisition directors. It was agreed that the writer would meet with the Commanding Officer and his staff (top management) to explain the purpose of the research and the method for administering the questionnaire. The agenda for this meeting is included in Appendix H.

On May 13 the writer briefed the Commanding Officer and his staff. At the briefing of the staff the sequence of events for the remainder of the study was explained and agreed upon in general terms; details were left to the survey coordinator. He made documents relating to personnel staffing, organizational structure, and mission available to the writer. These documents, in conjunction with interviews with administrative personnel, provided data used to describe the

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<sup>1</sup>This correspondence is included in Appendix E.



organizational mission, the structure of the organization, and the group of respondents to the questionnaire. Subsequently, the survey coordinator identified middle and first-line managers by name and agreed to a procedure and date for administration of the questionnaire.<sup>1</sup>

On July 15, 16, and 17 the Plan of the Day, a daily publication of the NTEC, announced the study and the impending questionnaire.<sup>2</sup> It seems clear that this announcement, together with a letter signed by the Commanding Officer transmitting a questionnaire to each participant, helped considerably to bring about the fine response to the questionnaire.<sup>3</sup>

The Personnel Staffing manual was used to identify, by name and position title, the personnel in the organization as of July 1, 1975.<sup>4</sup> From the list the survey coordinator identified all (149) managerial personnel in the organization and the element to which they were assigned. On July 17, questionnaires were mailed to all managers. Each questionnaire was individually addressed and included both the transmittal letter identified above and an addressed return envelope. The NTEC mail distribution system was used. Anonymity for the respondents, considered essential for unbiased replies, had been agreed to by NTEC top management.

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<sup>1</sup>For the purposes of this study middle managers are those who supervise other managers (exclusive of top management). First-line managers do not supervise other managers.

<sup>2</sup>A copy of this announcement is included in Appendix I.

<sup>3</sup>A copy of this letter is included as Appendix J.

<sup>4</sup>U. S., Department of the Navy, Personnel Staffing (Orlando, Florida: Naval Training Equipment Center, 1973), pp. 9-69.

By the end of the work week forty-four per cent of those receiving questionnaires had replied, and, by the end of the following work week the response was greater than seventy per cent. On July 28th, when the response was eighty-three per cent, a letter of appreciation was mailed to all of the 149 participants in the survey.<sup>1</sup> Since time was available, the letter extended the deadline for returning the questionnaires to August 4th ( it was expected that a number of managers may have been traveling on business or on leave during the mailing). A number of questionnaires returned as a result of the deadline extension resulted in an overall response of eighty-seven per cent (131) of the 149 questionnaires mailed. Two of the replies were considered unusable because the questionnaires were so incomplete; this left a total of 129 out of 149 usable responses (eighty-six per cent).

#### Tabulation of Response

The data for all 129 usable responses (hereafter referred to as responses) were coded and entered into eighty-column code sheets. Hollerith cards were then punched from the code sheets, the cards in turn being used for computer analysis of the data. Every answer on the questionnaire was quantifiable, either directly or via code. In all, 65 data elements were needed to encode a full questionnaire. For example, four elements were required to encode style-flexibility data, i.e., one element for each of four styles. Similarly, sixteen elements were required to encode leadership style data, i.e., one element for each of the sixteen bipolar adjective pairs presented in the Least-

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<sup>1</sup>A copy of this letter is included as Appendix K.

Preferred-Coworker instrument. The data elements and their coding are shown in Appendix L.

As each questionnaire was received, it was assigned a questionnaire number. From that point on, all reference to the questionnaire was by number. In this way anonymity was assured. Scalar organization level was derived from the notation "M" (middle manager) or "F" (first-line manager) previously placed on the first page of the questionnaire and on each performance evaluation device.

In all, managers at six different levels participated, but only two levels were used in coding since the managerial distinction to be made was only between first level and middle level.

Incomplete or unacceptable answers are to be expected with mailed questionnaires. To cope with such situations, unless there was clear evidence for deducing a valid answer, two rules were employed: 1) blanks were interpreted as "no answer", and 2) invalid answers were interpreted as "no answer". All 129 responses contained valid answers except that two Job Descriptive Index instruments and one Performance Evaluation instrument were blank. All were treated as "no answer". The size of the sample was not greatly reduced by these omissions.

There were three potential sources of error in the coding process. First, the data could be entered incorrectly on the code sheets. Second, the Hollerith cards could be punched incorrectly from the code sheets. Third, the cards could be incorrect due to keypunch machine error. The possibility of computer error was considered small. To check on these sources of error, a computer printout of all raw data was prepared in the format used on the coding sheets. All data elements



were then checked against the coding sheets, thus verifying the process of keypunching and computer handling.

To check for errors in entering data onto the coding sheets, a sample of fifteen questionnaires was selected at random and fully recoded. A comparison with the original entries revealed no errors.

### Statistical Approach

Data measured by either nominal or ordinal scales are the most common in the behavioral sciences;<sup>1</sup> data in the current study were basically ordinal. Ordinal measurements resulted from responses that were rank-ordered on characteristics such as leadership style flexibility, leadership style, leader satisfaction and subordinate performance, (each measured by a separate instrument). The responses did not indicate either absolute quantities or equal intervals between the numbers, but did indicate some kind of relation among possible responses such as higher, more preferred, etc. For instance, it could not be assumed that because numbers were equally spaced on the Performance Evaluation instrument that the underlying properties were equally spaced; i.e., where two respondents had scores of 30 and 25, and two other respondents had scores of 20 and 15, the differences between the first and second pairs were not equal-interval scales. As ordinal scale measurements, data were analyzed by nonparametric methods.<sup>2</sup>

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<sup>1</sup>Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, 1964), p. 422.

<sup>2</sup>Sidney Siegel, Nonparametric Statistics (New York: McGraw-Hill Book Company, 1956), p. 29.

Nonparametric techniques do not specify the conditions about the parameters of the population but do assume, for example, that observations are independent and have underlying continuity.<sup>1</sup> The scale of measurement required for nonparametric tests is ordinal and in some cases a nominal scale is acceptable. The following paragraphs identify and briefly describe the nonparametric statistical tests employed in the current study.<sup>2</sup>

A one-sample test was used to determine if there was a significant difference between observed frequencies and expected frequencies, e.g., between the observed number of responses in each style-flexibility group and the expected number of responses if the distribution of responses were uniform. The chi-square test (a goodness-of-fit test) that was employed, tested whether the observed frequencies were sufficiently close to the expected ones to be likely to have occurred under a null hypothesis.<sup>3</sup>

The chi-square test for two or more independent groups was used to test hypotheses in which groups differ with respect to some characteristic (and therefore with respect to the relative frequency with

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<sup>1</sup>Siegel, Nonparametric Statistics, p. 31, states that these assumptions are fewer and much weaker than those associated with parametric tests.

<sup>2</sup>Further details regarding the tests employed are presented in the following two chapters in conjunction with discussions of individual hypotheses.

<sup>3</sup>The chi-square one-sample test was used for Hypotheses One. This test is described by Siegel, Nonparametric Statistics, pp. 42-47.

which responses fall in several categories).<sup>1</sup> The chi-square test employed tested whether the distribution of observed frequencies in one group was similar to the observed distribution of frequencies in another group. Where frequencies were arranged in a 2 X 2 contingency table, a chi-square test (corrected for continuity) was employed.<sup>2</sup>

The degree of association between the scores obtained by each of the two instruments used for performance evaluation of subordinates was determined by calculation of the Spearman rank correlation coefficient ( $r_s$ ). The null hypothesis that the scores on the two instruments were not associated (that the observed value of  $r_s$  differed from zero only by chance) was used to test the significance of  $r_s$ .<sup>3</sup>

The measure of the extent of association of leadership style (as indicated by Least-Preferred-Coworker scores) and leadership style-flexibility (as indicated by the style-flexibility groups) was determined by calculation of the contingency coefficient C. The null hypothesis that the observed value of the measure of association could have arisen by chance was tested to determine the significance of the coefficient obtained.<sup>4</sup>

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<sup>1</sup>The chi-square test for two independent samples was used for Hypothesis Two through Ten. The chi-square test for  $k$  independent samples was used for Hypotheses Eleven, Twelve and Fourteen. These tests are described by Siegel, Nonparametric Statistics, pp. 104-111, and pp. 175-179.

<sup>2</sup>Siegel, Nonparametric Statistics, p. 64.

<sup>3</sup>The Spearman rank correlation coefficient (sometimes called RHO) and test for significance is described by Siegel, Nonparametric Statistics, pp. 203-213.

<sup>4</sup>The contingency coefficient C and test for significance is described by Siegel, Nonparametric Statistics, pp. 196-202.



Summary

This chapter discussed the process of selecting the test organization, the preparation of the questionnaire, the tabulation of results, gathering of data from the reports and the statistical approach employed. The following chapter presents an analysis of results which bear directly upon leadership style flexibility.

## CHAPTER IV

### ANALYSIS OF LEADERSHIP STYLE FLEXIBILITY DATA

#### Introduction

The results of the questionnaire survey which bear directly upon leadership style flexibility are presented in this chapter. A general description of the questionnaire response is given first, followed by presentation and analysis of data for the first three research questions which are concerned with leadership style flexibility. Research Questions One through Three are discussed in turn, and the results obtained in the current study are compared with the corresponding measures obtained in the Hill Study (as presented in Appendix B).

The presentation and analysis of data are continued in Chapter V which is concerned with leadership performance, satisfaction with leadership, and leadership style, each as related to leadership style flexibility. The actual replies to all instruments used in the current study are shown, in coded form, in Appendix M.

#### Questionnaire Response

The following two sections provide an overall description of the response to the survey and a brief description of the respondents.

## Survey Response

A total of 149 questionnaires was distributed by mail. Of those mailed, 131 replies were returned. Two of the replies were considered unusable because the questionnaire was so incomplete; the 129 usable responses to the 149 questionnaires distributed represented a response rate of eighty-six per cent. This is above average for mailed questionnaires.<sup>1</sup> The fact that only management personnel were included in the survey, that top management was given an orientation as to the intent of the study, and that the Commanding Officer (NTEC) gave full support to the study all contributed to achieving the high level of response.

Bias is always a potential source of error in questionnaire surveys, and this study is no exception.<sup>2</sup> The non-response rate of fourteen per cent was accounted for in the following manner. Records for all divisions of the NTEC showed that eight to ten per cent of all personnel could be expected to be taking vacations during July and August, and five to eight per cent of mission-oriented personnel could be expected to be traveling in the conduct of business.<sup>3</sup> This indicated that it would be reasonable to expect that between thirteen and eighteen per cent of the 149 potential respondents would be unavailable during the conduct of the field study, a figure consistent with the non-response

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<sup>1</sup>An average response ranges from 40-60 per cent, according to A. N. Oppenheim, Questionnaire Design and Attitude Measurement (New York: Basic Books, Inc. Publishers, 1966), p. 34.

<sup>2</sup>Ibid.

<sup>3</sup>From an interview with the Director of the Administrative Services Division, Aug. 15, 1975.



rate experienced. The reasons for the non-response do not seem to be related to the information sought. Additionally, by employing a large sample and because of the high rate of return, the effects of bias are small enough to be considered insignificant.

#### Description of Respondents

The respondents ranged in age from 24 years to 65 years with a median age being in the 35 to 49 year grouping.<sup>1</sup> The respondents were generally well educated; 42 held baccalaureate degrees (33 per cent); another 35 (28 per cent) had some college education; 38 had degrees at the master level (30 per cent) and four had the doctoral degree (3 per cent). Only one person did not finish high school (1 per cent) and six others (5 per cent) finished high school but did not continue their formal education.<sup>2</sup> No one had trade or vocational school education. Their salaries ranged from \$21,000 to \$41,500 with a median salary of \$25,000 annually.

#### Leadership Style Flexibility Data

Leadership style flexibility data were examined in the context of the first three research questions and their associated hypotheses. The following sections provide, first, a presentation of the data and then

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<sup>1</sup>The median could not be identified with any greater precision because only grouped data were collected; i.e., each respondent was asked to check the set of class limits which included his age. The mean of the grouped data was found to be  $\bar{X} = 47.9$ .

<sup>2</sup>A total of 126 replies were received to this question dealing with educational background. Percentages are based on the number of valid replies to each question.

an analysis of each of the following research questions.<sup>1</sup>

1. Are the leadership flexibility data observed in the current study independent of those observed by Hill?
2. Do subordinates perceive leaders using the same style of leadership for a variety of problems, or do they perceive leaders altering style to meet different situations?
3. Do leaders vary leadership style with the nature of the problem? If so, is the change more pronounced for middle or for first-line managers?

Summary and Conclusions pertaining to these research questions are provided at the end of the chapter.

#### Presentation of the Data

Analysis of leadership style flexibility questionnaire data indicated that respondents in the current study perceived that superiors demonstrated one of five degrees of leadership style flexibility ranging from high rigidity to high flexibility. Leadership style flexibility was defined as the subordinate managers' perception of the degree to which superiors would use different leadership styles in different situations. Superiors perceived to demonstrate high rigidity were placed in a Style Flexibility group termed SF-0; others were placed in intermediate groups termed SF-1, SF-2, and SF-3; and those with high flexibility were placed in a group termed SF-4. Table 5 summarizes the incidence of responses in each SF (style flexibility) group for

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<sup>1</sup>Associated hypotheses are presented in conjunction with the analysis of each research question.

TABLE 5

## LEADERSHIP STYLE FLEXIBILITY DATA

Leadership Style Flexibility		Management Level	Respondents			
			Current Study		Hill Study	
Group	Criteria		No.	Per Cent	No.	Per Cent
A single style employed for:						
SF-0	All four problems (high rigidity)	Middle	4	10.8	4	10.0
		First	<u>24</u>	26.0	<u>13</u>	15.6
		Total	28	21.7	17	13.8
SF-1	Three problems and another style for the fourth problem	Middle	9	24.3		
		First	<u>17</u>	18.5		
		Total	26	20.1	25	20.3
SF-2	Two problems and another different style for the other two problems	Middle	8	21.6		
		First	<u>21</u>	22.8		
		Total	29	22.5	34	27.6
SF-3	Two problems and two different style for other two problems	Middle	14	37.8		
		First	<u>30</u>	32.6		
		Total	44	34.1	43	35.0
SF-4	Each of the four problems (high flexibility)	Middle	2	5.4		
		First	<u>0</u>	0		
		Total	2	1.6	4	3.3
Totals		Middle	37	28.7	40	32.5
		First	<u>92</u>	71.3	<u>83</u>	67.5
		Total	129	100.0	123	100.0

NOTES: (1) Leadership style flexibility is defined on the previous page.

(2) Data for Hill's study is extracted from the summary presented in Appendix B. Blank spaces indicate these data were not available. Only 123 responses were placed in SF groups according to Hill, "Leadership Style Flexibility", p. 78.

(3) Percentages shown in the "Totals" rows are based on the total number of responses shown for each study. Percentages shown in the "Middle" and "First" rows are based on the total number of responses at each management level.



both the current study and the study by Hill.<sup>1</sup> The styles and problems (situations) were summarized earlier in Table 1.<sup>2</sup>

The most frequently perceived SF group in both studies was SF-3 which accounted for about one-third of all responses. Only two instances of SF-4 (1.6 per cent) were observed in the current study as compared to four instances (3.3 per cent) observed by Hill. In the remaining three groups 22.5 per cent were perceived in SF-2 as compared to 27.6 per cent in the Hill study; approximately 20 per cent were perceived as SF-1 in both studies; and 21.7 per cent were perceived as SF-0 as compared to 13.8 per cent in the Hill study. The following sections provide an analysis of these data in terms of the first three research questions.

#### Analysis of Research Question One

The first research question asked: Do leadership style flexibility data observed in the current study vary significantly from those observed by Hill? The response to this question involved testing Hypothesis One and Hypothesis Two using data extracted from Table 5.

#### Test of Hypothesis One

The possibility existed that each of the five SF groups had an equal opportunity of being perceived by respondents as being employed

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<sup>1</sup>The notation SF-0, SF-1, SF-2, SF-3, and SF-4 will be used to reflect style flexibility in the remainder of the study.

<sup>2</sup>Respondents were asked to indicate which of four styles their immediate superior would use to solve each of four different problems. The degree of leadership style flexibility that respondents ascribed to their superiors was determined by applying to each respondent's choices the criteria summarized in Table 5.

by their superiors. If this were the case, the appropriate theoretical probability distribution describing the pattern of expected response would be a uniform distribution. In this study the expected pattern associated with a uniform distribution was for each SF group to have  $129/5$  (total number of responses divided by the number of SF groups) or 25.8 responses. Table 5 shows the actual pattern of response in the current study. The question was whether the difference between the actual pattern of response and the uniform distribution was one that could reasonably be observed, given that the universe is truly uniform. The answer to the question is based on a statistical test of Hypothesis One which states:

$H_0$ : The distribution of style flexibility groups observed in the current study is a uniform distribution.

$H_a$ : The distribution of style flexibility groups observed in the current study is not a uniform distribution.

The test of this hypothesis is summarized in Table 6; the chi-square test procedure is described in Appendix N. From the evidence, the null hypothesis is rejected and the alternative is accepted.

#### Test of Hypothesis Two

An answer to the first research question required a determination of whether there was a significant difference between the proportions of respondents, in each of the two studies, who perceived superiors to be in each of the five style-flexibility groups (SF). This determination involved a statistical test of Hypothesis Two which stated:

TABLE 6

## TEST OF HYPOTHESES ONE AND TWO

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**Hypothesis One**

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Null ( $H_0$ )	$P_c = P_o$	where $P_c$ = Proportion expected by chance $P_o$ = Proportion observed
Alternative ( $H_a$ )	$P_c \neq P_o$	
Significance Level	0.05	4 d.f.
Statistical Test	$\chi^2$	
Decision Rule	Reject $H_0$ if: $\chi^2_{0.05} (4) > 9.487$	
Test Data	<u>Observed Values</u>	<u>Expected Values</u>
	28	25.8
	26	25.8
	29	25.8
	44	25.8
	2	25.8
Calculated Value:	$\chi^2 = 35.380$	
Decision:	Reject $H_0$	

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**Hypothesis Two**

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Null ( $H_0$ )	$P_h = P_c$	where $P_h$ = Proportion in Hill study $P_c$ = Proportion in current study
Alternative ( $H_a$ )	$P_h \neq P_c$	
Significance Level	0.05	4 d.f.
Statistical Test	$\chi^2$	
Decision Rule	Reject $H_0$ if: $\chi^2_{0.05} (4) > 9.487$	
Test Data	<u>Current Data</u>	<u>Hill Data</u>
	28	17
	26	25
	29	34
	44	43
	2	4
Calculated Value:	$\chi^2 = 3.642$	
Decision:	Cannot reject $H_0$ at specified level of significance	



$H_0$ : The incidence of subordinates perceiving superiors to be in each of the five style-flexibility groups is independent of (i.e., not dependent upon) the study in which the observations were made.

$H_a$ : The incidence of subordinates perceiving superiors to be in each of the five style-flexibility groups is dependent upon the study in which the observations were made.

The test of this hypothesis is summarized in Table 6; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance (0.05).<sup>1</sup>

#### Summary

A statistically significant difference between the results observed and a uniform distribution was found; the probability of the results observed occurring by chance was remote. Tests also indicated that there was no significant difference between the results observed in the two studies. The following research question was addressed to the examination of whether leaders are or are not perceived to alter leadership styles to meet the needs imposed by different situations.

#### Analysis of Research Question Two

The second research question asked: Do subordinates perceive leaders using the same style of leadership for a variety of problems, or do they perceive leaders altering styles to meet different situations?

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<sup>1</sup>The level of significance (0.05) employed in this study is the same value as that employed by Hill. Appendix N includes a discussion of the level of significance.

The response to this question involved further analysis of the results tabulated in Table 5 and testing Hypothesis Three and Hypothesis Four.

#### Analysis of Results

The results recorded in Table 5 show that 21.7 per cent of the total respondents in the present study perceived their superiors to be in Class SF-0; i.e., they perceived that their superiors would use the same leadership style in dealing with four different situations; or, conversely, that approximately 78 per cent of the respondents perceived that their superiors would alter their style to meet different situations. The corresponding observation by Hill was that 13.8 per cent perceived that superiors would be in SF-0, i.e., that approximately 86 per cent would alter their leadership style to meet different situations.

The results also showed that in both studies the greatest proportion of the respondents who perceived their superiors to be in SF-0 were managers at the first level. The current study showed that 26 per cent of first-level managers and 10.8 per cent of middle managers perceived their superiors to have high style rigidity (SF-0), while the corresponding observations in the Hill study were 15.6 per cent and 10 per cent.

#### Test of Hypothesis Three

A determination as to whether there was a significant difference between the proportions of superiors perceived to rely upon one style of leadership in the current study and in the study conducted by Hill involved a test of the third hypothesis which stated that:

$H_o$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is no significant difference between the proportions observed by Hill and the proportions observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is a significant difference between the proportions observed by Hill and the proportions observed in the current study.

The test of this hypothesis is summarized in Table 7; the chi-square test procedure used is described in Appendix N. From the evidence gathered in this study the null hypothesis cannot be rejected at the chosen level of significance.

#### Test of Hypothesis Four

A determination, in the current study, as to whether there was a significant difference between the proportions of managers perceived to rely upon one style of leadership at the two managerial levels involved a test of the fourth hypothesis which stated:

$H_o$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is no significant difference between the proportion of middle managers and proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to rely upon one style of leadership there is a significant difference between the proportion of middle managers and proportion of first-line managers observed in the current study.



TABLE 7

## TEST OF HYPOTHESES THREE AND FOUR

Hypothesis Three

Null ( $H_0$ )	$P_h = P_c$	where $P_h$ = Proportion in Hill study $P_c$ = Proportion in current study
Alternative ( $H_a$ )	$P_h \neq P_c$	
Significance Level	0.05, 1 d.f.	
Statistical Test	$\chi^2$	
Decision Rule	Reject $H_0$ if: $\chi^2_{0.05} (1) > 3.841$	
Test Data	<u>Number Same Style</u>	<u>Number Not Same Style</u>
Hill Study	17	107
Current Study	28	101
Calculated Value:	$\chi^2 = 2.244^*$	
Decision:	Cannot reject $H_0$ at specified level of significance	

Hypothesis Four

Null ( $H_0$ )	$P_m = P_f$	where $P_m$ = Proportion of middle managers $P_f$ = Proportion of first-level managers
Alternative ( $H_a$ )	$P_m \neq P_f$	
Significance Level	0.05, 1 d.f.	
Statistical Test	$\chi^2$	
Decision Rule	Reject $H_0$ if: $\chi^2_{0.05} (1) > 3.841$	
Test Data	<u>Number Same Style</u>	<u>Number Not Same Style</u>
Middle	4	33
First	24	68
Calculated Value:	$\chi^2 = 2.780^*$	
Decision:	Cannot reject $H_0$ at specified level of significance	

\* Corrected for continuity.

The test of this hypothesis is summarized in Table 7; the chi-square test procedure used is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.

### Summary

Analysis of data gathered in the current study indicated that subordinates perceive leaders as altering their style to meet different situations. No significant difference was found between the proportions of superiors perceived to vary leadership style in the two studies or between the proportions perceived at the two managerial levels. The acceptance of the two hypotheses tested is testimony of the similarity of results of the two studies and the similarity of perception of style flexibility at the two managerial levels. Thus the current study confirms Hill's findings regarding Research Question Two. The following research question was addressed to examination of the variation of leadership style with the nature of the problem.

### Analysis of Research Question Three

The third research question asked: Do leaders vary leadership style with the nature of the problem? If so, is the change more pronounced for middle or for first-line managers? The answer involved examination of three corollary questions, the first two of which formed the basis of Hill's answer to this research question. The third corollary question extended the examination of the research question through the analysis of pertinent data in a context that differs from that employed by Hill. The corollary questions were:

Corollary A: What proportions of respondents perceived that their superiors categorized problems as dichotomous pairs?

Corollary B: What proportion of respondents perceived that their superiors categorized problems in terms of like problem attributes?

Corollary C: What proportion of respondents (by style-flexibility group) perceived superiors to place problems in each of the four categories of like problem attributes and in each of the two categories of an admixture of all problem attributes?

An answer to the research question required an examination of both style flexibility and the nature of the problem. Style flexibility depended upon the number of leadership styles the leader was perceived to employ in solving four problems. As indicated in Table 5, analysis of data indicated that leaders were perceived by subordinates as being in one of five SF groups. The nature of the problem was expressed in terms of pairs of the following attributes: Interpersonal, technical, complex, and simple.<sup>1</sup> Each of the problems presented in the questionnaire designed by Hill possessed two attributes arranged as interpersonal-complex (problem 1), technical-complex (problem 2), interpersonal-simple (problem 3), and technical-simple (problem 4).

The following sections provide an examination of the first two corollary questions in terms of the problem attributes, an examination

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<sup>1</sup>These attributes were previously identified in Table 1, Chapter 1.



of the third corollary question in terms of both SF groups and problem attributes, and a summary which presents an answer to the third research question.

#### Corollary A

This corollary question asked: What proportion of respondents perceived that their superiors categorized problems as dichotomous pairs? Specifically, what proportion were perceived to use one style for two complex problems and another style for two simple problems; or used one style for two interpersonal problems and another style for two technical problems? This section answers this question in terms of current study data, compares results of the two studies, and identifies differences observed between first-line and middle managers.

The criteria developed by Hill to identify dichotomous pairs (and which are also used in the present study) and the data used in the following analysis are presented in Table 8.

These data show that in the current study 6.2 per cent of the respondents perceived that their superiors used one style for complex and another style for simple problems; and that 12.4 per cent of the respondents perceived superiors as using the same style for interpersonal and a different style for technical problems. It follows that 93.8 per cent perceived that their superiors did not make a distinction between simple and complex problems; and 87.6 per cent of the respondents did not make the distinction on the basis of interpersonal and technical characteristics of the situation; or that 81.4 per cent of the respondents did not perceive superiors as selecting a leadership

TABLE 8  
CRITERIA AND DATA FOR DICHOTOMOUS PAIRS

I. Hill's Criteria for Selection of Dichotomous Pairs									
IF					THEN				
one style is used for problem numbers:		and another style is used for both problem numbers:			Subordinates perceive superior using one leadership style for:				
1 and 2		2 and 4			Simple problems and one different style for complex problems				
1 and 3		2 and 4			Interpersonal problems and one different style for technical problems				

II. Data Observed																
Management-Level	Choice Made on a Dichotomous Basis					Choice Not Made on a Dichotomous Basis										
	One Style For: Complex and another for simple					Interpersonal and another for technical										
	Current No.	Hill %	Current No.	Hill %		Current No.	Hill %	Current No.	Hill %							
Middle	2	5.4	2	5.0	5	13.5	7	17.5	30	81.1	31	71.5	37	100.0	40	100.0
First	6	6.5	7	8.3	11	12.0	15	17.9	75	81.5	62	73.8	92	100.0	84	100.0
Total	8	6.2	9	7.3	16	12.4	22	17.7	105	81.4	93	75.0	129	100.0	124	100.0

NOTE: There were 124 responses involved in his calculations according to Hill, "Leadership Style Flexibility", pp. 70-76. Percentages shown in the "Totals" row are based on the total number of responses for each study. Percentages shown in the "Middle" and "First" row are based on the total number of responses at each management level.

style on a dichotomous basis. Comparable data from the Hill study indicated that 75.0 per cent of the respondents did not perceive superiors as selecting leadership style on a dichotomous basis.

Data in Table 8 also show that in the current study there is no great difference (0.4 per cent) between the proportion of middle managers (18.9 per cent) and the proportion of first-line managers (18.5 per cent) who perceived superiors selecting leadership style on a dichotomous basis; however, a 3.7 percentage point difference between middle managers (22.5 per cent) and first-line managers (26.2 per cent) was indicated in the Hill study. The following sections report the tests of significance of difference between the two studies and the two managerial levels.

#### Test of Hypothesis Five

$H_0$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no significant difference between the proportions observed in the current study and those observed by Hill.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant difference between the proportions observed in the current study and those observed by Hill.

The test of this hypothesis is summarized in Table 9; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.



TABLE 9  
TEST OF HYPOTHESES FIVE, SIX, AND SEVEN

	Hypothesis Five	Hypothesis Six	Hypothesis Seven
Null ( $H_0$ )	$P_c = P_h^1$	$P_m = P_f^2$	$P_m = P_f$
Alternative ( $H_a$ )	$P_c \neq P_h$	$P_m \neq P_f$	$P_m \neq P_f$
Significance Level	0.05, 1 d.f.	0.05, 1 d.f.	0.05, 1 d.f.
Statistical Test	$\chi^2$	$\chi^2$	$\chi^2$
Decision Rule	$\chi^2_{0.05} (1) > 3.841$	$\chi^2_{0.05} (1) > 3.841$	$\chi^2_{0.05} (1) > 3.841$
Reject $H_0$ if:			
Test Data	<div> <div>Number Perceived to Meet Criteria</div> <div> <div>Not Meet Criteria</div> <div>114</div> </div> </div>	<div> <div>Number Perceived to Meet Criteria</div> <div> <div>Not Meet Criteria</div> <div>114</div> </div> </div>	<div> <div>Number Perceived to Meet Criteria</div> <div> <div>Not Meet Criteria</div> <div>114</div> </div> </div>
Calculated $\chi^2$	<div> <div>Hill Current</div> <div>31 24</div> <div>93 105</div> </div>	<div> <div>First Middle (Hill Study)</div> <div>9 22</div> <div>31 62</div> </div>	<div> <div>First Middle (Current Study)</div> <div>7 17</div> <div>30 75</div> </div>
Decision	$\chi^2 = 1.167$ Cannot reject $H_0$ at specified level of significance	$\chi^2 = 0.0492$ Cannot reject $H_0$ at specified level of significance	$\chi^2 = 0.0369$ Cannot reject $H_0$ at specified level of significance

NOTES: (1)  $P_c$  = Proportion in current study;  $P_h$  = Proportion in Hill's study.  
(2)  $P_m$  = Proportion of middle managers;  $P_f$  = Proportion of first-line managers.

## Test of Hypothesis Six

$H_0$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

The test of this hypothesis is summarized in Table 9; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.

## Test of Hypothesis Seven

$H_0$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportion of managers perceived to categorize problems as dichotomous pairs there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

The test of this hypothesis is summarized in Table 10; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.

#### Summary

The proportions of respondents who perceived their superiors to categorize problems as dichotomous pairs are presented in Table 8. Analysis of data gathered in the current study indicated that subordinates perceived leaders to vary leadership style on the basis of problems being dichotomous to only a limited extent. A clear majority of respondents in both studies (75 per cent or more) did not perceive superiors selecting leadership style on the basis of problems being dichotomous. In those instances where the distinction was made, a greater proportion were observed to make the distinction on the basis of content (interpersonal and technical) rather than relative complexity (simple and complex). Regarding the proportion of managers perceived to categorize problems as dichotomous pairs, no significant difference was identified between studies, nor was any significant difference perceived between the two managerial levels in either study. The following section provides an examination of the proportion of respondents who perceived their superiors to categorize problems in terms of like-attributes.

#### Corollary B

This corollary question asked: What proportion of respondents perceived that their superiors categorized problems in terms of like



problem attributes. Specifically, what proportion were perceived to use the same style for certain types of problems (those with like attributes) although not rigidly adhering consistently to another, different, style for other types of problems. This section answers this question in terms of current study data, compares results of the two studies, and identifies differences observed between first-line and middle managers.

The criteria developed by Hill, and used in this study, to identify problems with like attributes are presented in Table 10.

TABLE 10

HILL'S CRITERIA FOR SELECTION OF  
PROBLEMS WITH LIKE ATTRIBUTES

Superiors were perceived to use the same style for certain types of problems (problems with like attributes) and a different style for other types of problems:	
IF Response on leadership flexibility questionnaire showed use of the same style for:	THEN Subordinates perceived superiors to use the same leadership style for:
Problems <u>1</u> and <u>2</u> Problems <u>1</u> and <u>3</u> Problems <u>2</u> and <u>4</u> Problems <u>3</u> and <u>4</u>	complex problems interpersonal problems technical problems simple problems

NOTE: Use of the same style for problems 1 and 4 and problems 2 and 3 was not considered by Hill.

Data relevant to this corollary question are assembled in Table 11. As indicated in the table, responses were placed in four categories, i.e., respondents who perceived superiors as using the same leadership style for simple, complex, interpersonal, and technical problems. For example, the interpersonal category refers to use of the same style for problems with an interpersonal attribute regardless of whether the problem is also simple or complex.

These data show that in the current study more than one-third of the respondents perceived that their superiors categorized problems in terms of like attributes. The greatest percentage (58.1 per cent) noted in the current study was perceived to utilize the same leadership style for technical problems, followed by 45.7 per cent perceived to use the same style for interpersonal problems, 45.7 per cent for simple problems, and 36.4 per cent for complex problems. Respondents in the Hill study observed 48.5 per cent for technical problems, 46.7 per cent for interpersonal, 36.2 per cent for simple, and 37.1 per cent for complex problems.<sup>1</sup>

These data also show the number of respondents at each managerial level in both studies who perceived that their superiors categorized problems in terms of like attributes. First-line managers in the current study perceived a greater proportion of their superiors using the same style in all categories than did middle managers. Data from the Hill study indicated that this relative perception occurred

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<sup>1</sup>As a consequence of the context in which Hill examined the data, the sum of the four percentages (in each study) is greater than 100 per cent. A later section in this chapter presents the data in a different context, i.e., without an overlap of responses.

TABLE 11

## DATA FOR PROBLEMS WITH LIKE ATTRIBUTES

Management Level	Subordinates perceiving superiors as using the same leadership style for:											
	Number of Respondents		Simple Problems		Complex Problems		Interpersonal Problems		Technical Problems			
	Current Study	Hill Study	Current Study	Hill Study	Current Study	Hill Study	Current Study	Hill Study	Current Study	Hill Study	Current Study	Hill Study
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Middle	37	40	14	37.8	13	32.5	10	27.0	16	40.0	18	48.6
First	92	84	45	48.9	32	38.1	37	40.2	30	35.7	57	61.9
Total	129	124	59	45.7	45	36.2	47	36.4	46	37.1	75	58.1
											119	48.3

NOTE: There were 124 responses involved in his calculations according to Hill, "Leadership Style Flexibility", pp. 70-76. Percentages shown in the "Totals" row are based on the total number of responses shown for each study. Percentages shown in the "Middle" and "First" row are based on the total number of responses at each management level.



only in the case of simple and interpersonal problems.

The following sections report the tests of significance of differences between the two studies and between the managerial levels.

#### Test of Hypothesis Eight

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportions observed in the current study and those observed by Hill.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is a significant difference between the proportions observed in the current study and those observed by Hill.

The test of this hypothesis is summarized in Table 12; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.

#### Test of Hypothesis Nine

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

TABLE 12  
TEST OF HYPOTHESES EIGHT, NINE, AND TEN

Hypothesis No. Statement	Signif- icance Level	Statis- tical Test	Critical Value	Data Used for Test					
				Simple $\bar{Y}$ $\bar{N}$ $\bar{N}^2$	Complex $\bar{Y}$ $\bar{N}$	Interpersonal $\bar{Y}$ $\bar{N}$	Technical $\bar{Y}$ $\bar{N}$		
Eight $H_0: P_h = P^3$ $H_a: P_h^O \neq P_h^C$	0.05	$\chi^2$	<u>3.841</u>	(Hill) (Current) $\chi^2 = 1.956$	46 78 47 82 0.00045	58 66 59 70 0.00155	60 64 75 54 2.04		
Decision: <sup>1</sup> Cannot reject $H_0$ in any of 4 groups at specified level of significance.									
Nine $H_0: P_f = P^4$ $H_a: P_f^O \neq P_f^m$ (Hill Study)	0.05	$\chi^2$	<u>3.841</u>	(First) (Middle) $\chi^2 = 8.79$	16 108 30 94 4.511	17 107 41 83 11.905	22 102 38 86 4.94		
Decision: <sup>1</sup> Reject $H_0$ in all 4 groups of data.									
Ten $H_0: P_f = P^m$ $H_a: P_f^O \neq P_f^m$ (Current Study)	0.05	$\chi^2$	<u>3.841</u>	(First) (Middle) $\chi^2 = 19.78$	10 119 37 92 17.59	14 115 45 84 19.78	18 111 57 72 27.14		
Decision: <sup>1</sup> Reject $H_0$ in all 4 groups of data.									

- NOTES:
- (1) Decision Rule: Reject  $H_o$  if  $\chi^2_{0.05} (1) > 3.841$ .
  - (2)  $\bar{Y}$  means that superior was perceived to use same style.  
 $\bar{N}$  means that superior was not perceived to use the same style.
  - (3)  $P_c$  = Proportion in current study;  $P_h$  = Proportion in Hill's study.
  - (4)  $P_m$  = Proportion of middle managers;  $P_f$  = Proportion of first-line managers.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the Hill study.

The test of this hypothesis is summarized in Table 12; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis is rejected.

#### Test of Hypothesis Ten

$H_0$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is no significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

$H_a$ : Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like problem attributes there is a significant difference between the proportion of middle managers observed and the proportion of first-line managers observed in the current study.

The test of this hypothesis is summarized in Table 12; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis is rejected.



### Summary

The proportions of respondents who perceived their superiors to categorize problems in terms of like problem attributes are presented in Table 11. Analysis of data gathered in the current study indicated that subordinates perceived leaders to vary leadership style on the basis of using a single style for problems with technical attributes most frequently (58.1 per cent). The next most frequent bases were interpersonal and simple (each 45.7 per cent), and problems with complex attributes were treated with the same style least frequently (36.4 per cent).

Regarding the proportions of managers perceived to react to situations by using the same leadership style for problems with like attributes, no significant difference was identified between studies; however, there was a significant difference between the two managerial levels in both studies.

The following section employs a variation in methodology, which avoids the overlap previously noted, to examine how leaders vary leadership style with the nature of the problem.

### Corollary C

This corollary question asked: What proportion of respondents in each style-flexibility group perceived superiors to place problems in each of the four categories of like problem attributes and in each of two categories of an admixture of all problem attributes? The question served to extend examination of the question of how leaders vary leadership style with the nature of the problem (the third

research question) by examining pertinent data in a context that avoided the overlap noted in the discussion of Corollary B.

The analysis employed in answering Corollary Question B (a replication of Hill's analysis) resulted in an overlap of responses recorded. This occurred when a response indicated that the superior was perceived to employ the same style for more than one pair of the problems posed in the questionnaire. For example, a response indicating use of the same style for problems 1, 2, and 3 was recorded in Table 11 in both the complex and interpersonal columns, because the superior was perceived to use the same style for complex problems (problems 1 and 2) and also the same style for interpersonal problems (problems 1 and 3).

The analysis which follows takes into account that there are six different pairs of problems (1 and 2, 1 and 3, 2 and 4, 3 and 4, 1 and 4, and 2 and 3), for which the same leadership style can be used. In the analysis, each pair is termed a category and referred to as complex, interpersonal, technical, simple, admixture X and admixture Y, respectively. The criteria employed to determine the category in which a response should be recorded are summarized in Table 13.

This section served to answer the corollary question through an analysis of current study data that avoided overlap and which identified differences observed between first and middle management levels. Data available were insufficient to permit comparison of the results of the two studies using the approach employed in the following section.

#### Analysis of Data

The purpose of this section is to analyze the data observed in the current study using a procedure that accounts for all pairs of

TABLE 13  
CRITERIA EMPLOYED TO DETERMINE CATEGORY OF RESPONSE

Problem Number And Associated Attributes	Regardless of whether problem was:			Superior was perceived to use the same style for:
	Technical or interpersonal the superior was perceived to use the same style for:	Simple or complex the superior was perceived to use the same style for:	Problems I & IV Admixture X	
I Interpersonal and Complex	Simple Problems	Complex Problems	Interpersonal Problems	Problems II & III Admixture Y
II Technical and Complex	S i m p l e	C o m p l e x	I n t e r p e r s o n a l	A d m i x t u r e X
III Interpersonal and Simple			T e c h n i c a l	A d m i x t u r e Y
IV Technical and Simple				



problems and that eliminates the overlap reflected in Table 11. The analysis involved a discussion of exclusion of two SF groups from consideration in the analysis; and a discussion of the rationale employed in assigning responses in the remaining three SF groups to six categories of situations.

Respondents perceived their superiors to be in a range of five SF groups, each SF group having a different degree of flexibility.<sup>1</sup> Two of the SF groups were excluded from the analysis for the following reasons:

1. Group SF-0 was characterized by inflexible use of one of the four styles for all four problems. Since respondents did not perceive superiors to make a distinction among the four problems, inclusion of this group would not make a meaningful contribution to an analysis dealing with selection of a leadership style to deal with pairs of problems.

2. Group SF-4 was characterized by use of a different style for each problem. Since respondents did not perceive superiors to use the same style for any pair of problems, there was no basis for inclusion of this group of respondents in an analysis dealing with selection of a leadership style to deal with pairs of problems.

The 99 responses in the three remaining SF groups accounted for 76.7 per cent of all responses to the study. Using the criteria summarized in Table 13 responses were recorded in the six categories identified earlier. Overlapping entries for the 99 responses were

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<sup>1</sup>Leadership style flexibility data and the criteria used to establish each style flexibility group (SF group) were presented in Table 6.

avoided by recording partial entries as explained below and as summarized in the distribution of responses among categories and SF groups in Table 14:

1. Responses characterized by use of a single style for three of the four problems and use of a different style for the fourth problem (SF-1) had the effect of use of the same style for two pairs of problems (where each pair was a separate category). Overlapping entries were avoided by recording a partial entry in each of the two categories. For example, a response indicating use of the same style for problems 1, 2, and 3 was recorded as one-half response in the complex category and one-half response in the interpersonal category. Other combinations of three problems involving use of the same style were treated similarly.

2. Responses characterized by use of a single style for two of the four problems and use of a different style for the other two problems (SF-2) also resulted in overlapping entries. Again, overlapping entries were avoided by recording a partial entry in each of the two categories. For example, a response indicating use of the same style for problems 1 and 2, and a different style for problems 3 and 4, was recorded as one-half response in the complex category and one-half response in the simple category. Other combinations of two problems and two different styles were tested similarly.

3. Responses characterized by use of a single style for two of the four problems and use of two different styles for the other

TABLE 14  
TYPES OF SITUATIONS VS. LEADERSHIP STYLE-FLEXIBILITY GROUPS  
(DISTRIBUTION OF RESPONSES AMONG CATEGORIES AND SF GROUPS)

Style Flexibility Group	Simple Problems	Complex Problems	Interpersonal Problems	Technical Problems	Admixture X	Admixture Y
SF-1 Middle Managers	11, 22, 43, 77, 92, 116	84, 98, 111	11, 77, 92	22, 43, 84, 98, 111, 116		
First-Level	4, 12, 17, 26, 28, 41, 52, 60, 85, 96, 122	39, 42, 64, 78, 102, 104	26, 28, 39, 42, 52, 85, 104	4, 12, 17, 41, 60, 64, 78, 96, 102, 122		
SF-2 Middle Managers	70, 90	70, 90	21, 25, 93, 108, 125	21, 25, 93, 108, 125	121	121
First-Level	34, 94, 103, 117, 118, 127	34, 94, 103, 117, 118, 127	19, 37, 45, 47, 54, 56, 69, 61, 81, 83, 86	19, 37, 45, 47, 54, 56, 69, 61, 81, 83, 86	31, 50, 73, 80	31, 50, 73, 80
SF-3 Middle Managers	82, 115	8	46, 129	24, 38, 120	9, 58, 63, 71	1, 2
First-Level	23, 40, 49, 123	35	33, 53, 106	7, 14, 18, 20, 27, 29, 32, 44, 55, 72, 75, 97	10, 68, 87, 100, 105, 119	48, 74, 89, 107

NOTE: Numbers refer to the number assigned to each questionnaire when returned. A fractional response was recorded in each column of Table 16 in those instances where the same number appears in more than one column.



two problems (SF-2) did not result in overlapping entries. A response indicating the pair for which the same style was used to be 1 and 2, 3 and 4, 1 and 3, 2 and 4, 1 and 4, or 2 and 3, were recorded in the appropriate category.

The results of the analysis are presented in Table 15. The following section examines the proportions of respondents in each SF group who perceived superiors to use the same style in each of the six categories.

#### Problem Nature and SF Groups

The purpose of this section is to examine how leaders vary leadership style with the nature of the problem. An examination is made of the proportion of respondents in each style-flexibility group who perceived superiors to place problems in each of the four categories of like problem attributes and in the two categories of an admixture of all problem attributes. Data relevant to the following discussion, presented in Table 15, account for the 99 responses earlier identified as being distributed among SF-1, SF-2, and SF-3.

The proportion of respondents in all three groups that perceived their superiors to use the same style for technical problems was 24.0 per cent.<sup>1</sup> Approximately equal proportions of superiors were perceived

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<sup>1</sup>The percentages indicated in this discussion are with respect to the 129 respondents to the study unless otherwise indicated.

TABLE 15  
TYPES OF SITUATIONS VS. LEADERSHIP STYLE-FLEXIBILITY GROUPS

Leadership Style- Flexibility Group	Manage- ment Level	Totals No. %	Regardless of whether problem was:								Superior was perceived to use same style for problems:			
			Technical or inter- personal, superior was perceived to use same style for:		Simple or complex, superior was per- ceived to use same style for:		Interpersonal Technical Situation		Situation					
			Simple Situation No. %	Complex Situation No. %	Simple Situation No. %	Complex Situation No. %	Interpersonal Situation No. %	Technical Situation No. %	Interpersonal Situation No. %	Technical Situation No. %	1 and 4 Admixture No. %	2 and 3 Admixture No. %	Y No. %	
SF-1	Middle	9 6.9	3 2.3	1.5 1.2	1.5 1.2	3 2.3			0 0	0 0				
	First	17 13.2	5.5 4.3	3 2.3	3.5 2.7	5 3.9			0 0	0 0				
	Total	26 20.1	8.5 6.6	4.5 3.5	5 3.9	8 6.2			0 0	0 0				
SF-2	Middle	8 6.2	1 0.8	1 0.8	2.5 1.9	2.5 1.9			0.5 0.4	0.5 0.4				
	First	21 16.3	3 2.3	3 2.3	5.5 4.3	5.5 4.3			2 1.6	2 1.6				
	Total	29 22.5	4 3.1	4 3.1	8 6.2	8 6.2			2.5 1.9	2.5 1.9				
SF-3	Middle	14 10.9	2 1.6	1 0.8	2 1.6	3 2.3			4 3.1	2 1.6				
	First	30 23.2	4 3.1	1 0.8	3 2.3	12 9.3			6 4.7	4 3.1				
	Total	44 34.1	6 4.7	2 1.6	5 3.9	15 11.6			10 7.8	6 4.7				
All Three	Middle	31 24.0	6 4.7	3.5 2.7	6 4.7	8.5 6.6			4.5 3.5	2.5 1.9				
	First	68 52.7	12.5 9.6	7.0 5.4	12 9.3	22.5 17.4			8.0 6.2	6 4.7				
	Total	99 76.7	18.5 14.3	10.5 8.1	18 14.0	31.0 24.0			12.5 9.7	8.5 6.6				

NOTE: Percentages shown are based on 129 responses.

to use the same style for simple problems (14.3 per cent) and inter-personal problems (14 per cent). In the case of complex problems the proportion was 8.1 per cent. These four categories accounted for 60.4 per cent of all responses. The remainder of the 99 responses considered in the analysis associated with Corollary C were divided between Admixture X (9.7 per cent) and Admixture Y (6.6 per cent), which together amount to 16.3 per cent. These latter two categories were excluded from further analysis because:

1. The proportions of respondents who perceived superiors responding in terms of the same style for simple, complex, inter-personal or technical attributes had been established.
2. The heterogeneous content of the responses (each response possessed all four attributes) indicated that no dominant attribute (of the four possibilities) was perceived by the respondent.
3. The possibility exists that Admixtures X and Y may be indicative of an intervening variable which accounts for internal and directly unobservable processes that in turn account for the responses given.

Considering the four categories of like problem attributes in terms of all three SF groups at one time, superiors were perceived to select the same style for technical problems most frequently, simple problems less frequently, and interpersonal and complex problems still less frequently, in that order.



The most flexible of the three style-flexibility groups considered was SF-3 (three different styles for four problems) which accounted for 34.1 per cent of all responses. Within this group the proportions of superiors perceived to use the same style was 11.6 per cent for technical problems, 4.7 per cent for simple problems, 3.9 per cent for interpersonal problems and 1.6 per cent for complex problems. The next most flexible style group was SF-2 (one style for one pair and another style for the other pair of problems), which accounted for 22.5 per cent of all responses. Within this group respondents perceived 6.2 per cent of superiors as using the same style for technical problems, 6.2 per cent for interpersonal problems and 3.1 per cent each for simple and complex problems. The least flexible style flexibility group was SF-1 (one style for three problems and another style for the remaining problem) which accounted for 20.1 per cent of all responses. Within this group respondents perceived almost equal proportions of superiors using the same style for technical problems (6.2 per cent) and for simple problems (6.6 per cent). These respondents also perceived almost equal proportions in the interpersonal (3.9 per cent) and complex (3.5 per cent) categories.

Within each of the three SF groups superiors were perceived to select the same style for complex problems least frequently; and, with the exception of SF-1 (where simple was 6.6 per cent and technical 6.2 per cent), they selected the same style for technical problems most frequently. The foregoing pattern is approximately equivalent to the extremes of the pattern observed for all three SF groups simultaneously.

Only SF-3 followed the simultaneous pattern; the two less flexible styles (SF-1 and SF-2) differed from the simultaneous pattern and from each other except at the extremes. As style flexibility increased from SF-1 to SF-3 the proportion perceived to use the same style for technical problems increased and the proportion for complex problems decreased. There is no identifiable pattern for simple and interpersonal.

#### Problem Nature and Managerial Level

Differences between the proportions of middle managers and proportions of first-line managers perceived to use the same style in the four categories of like attributes were noted. Pertinent data are assembled below in Table 16.

TABLE 16  
MANAGERIAL LEVEL DATA

Superior was perceived to use same style for:	Managerial Level					
	Middle		First		Total	
	No.	%	No.	%	No.	%
Simple Problems	6	19.4	12.5	18.4	18.5	18.7
Complex Problems	3.5	11.3	7	10.3	10.5	10.6
Interpersonal Problems	6	19.4	12	17.6	18	18.2
Technical Problems	8.5	27.4	22.5	33	31	31.3
Admixture <u>X</u>	4.5	14.5	8	11.7	12.5	12.6
Admixture <u>Y</u>	<u>2.5</u>	<u>8.1</u>	<u>6</u>	<u>8.8</u>	<u>8.5</u>	<u>8.6</u>
Totals	31.0	100.1	68.0	99.9	99.0	100.0

NOTE: Percentages shown are based on the totals shown at the bottom of each column.

A slightly greater proportion of middle managers than first-line managers was perceived to use the same style in all categories except the technical where 33.0 per cent of first-line managers were perceived to use the same style as compared to 27.4 per cent of middle managers.

The following section reports the test of significance of differences between the managerial levels.

#### Test of Hypothesis Eleven

$H_0$ : Regarding the proportion of managers in the intermediate flexibility styles (SF-1, SF-2, and SF-3) perceived to vary leadership styles with the nature of the problem attributes, there is no significant difference between the proportions of middle managers and first-line managers so perceived.

$H_a$ : Regarding the proportion of managers in the intermediate flexibility styles (SF-1, SF-2, and SF-3) perceived to vary leadership styles with the nature of the problem attributes, there is a significant difference between the proportions of middle managers and first-line managers so perceived.

The test of this hypothesis is summarized in Table 17; the chi-square test procedure is summarized in Appendix N. From the evidence the null hypothesis cannot be rejected at the chosen level of significance.



TABLE 17

## TEST OF HYPOTHESIS ELEVEN

Null ( $H_0$ )	$P_m = P_f$	where $P_m$ = proportion of middle managers				
Alternative ( $H_a$ )	$P_m \neq P_f$	$P_f$ = proportion of first-level managers				
Significance Level	0.05, 5 d.f.					
Statistical Test	$\chi^2$					
Decision Rule						
Reject $H_0$ if:	$\chi^2_{0.05} (5) > 11.07$					
Test Data:						
	<u>Simple</u>	<u>Complex</u>	<u>Inter-personal</u>	<u>Technical</u>	<u>Admixture X</u>	<u>Admixture Y</u>
(Middle)	6	3.5	6	8.5	4.5	2.5
(First)	12.5	7.0	12	22.5	8	6
Calculated Value	$\chi^2 = 0.42543$					
Decision:	Cannot reject $H_0$ at specified level of significance.					

## Summary

The proportions of respondents who perceived their superiors to categorize problems in terms of like problem attributes are presented in Table 16. Analysis of the data indicated that subordinates perceived leaders to select the same style for technical problems most frequently, and to select the same style for complex problems least frequently. The analysis revealed that as leadership style flexibility increased from SF-1 to SF-3, the proportion of managers perceived to use the same style for technical problems increased and the proportion for complex problems decreased, with no discernible pattern for simple and interpersonal problems.

Regarding the proportions of managers in the intermediate style flexibility groups (SF-1, SF-2, and SF-3) perceived to vary leadership style with the nature of problem attributes, no significant difference was identified between managerial levels.

The following section presents a summary of the findings for the first three research questions.

#### Summary and Results

This chapter has presented the analysis of data gathered for the purpose of seeking answers to the first three research questions. The results of the analysis are presented below.

Research Question One, which dealt with whether current style flexibility observations were independent of those observed by Hill, was examined by test of Hypotheses One and Two. The following results were observed:

1. Test of Hypothesis One indicated that the distribution of style flexibility groups observed in the current study was not a uniform distribution.
2. Test of Hypothesis Two indicated that there was no statistically significant difference between the results observed by Hill and the results observed in the current study.

Research Question Two, which sought to determine if leaders altered style to meet different situations, was examined by test of Hypotheses Three and Four. The following results were observed:

3. Analysis of current study data indicated that subordinates perceive leaders as altering their styles to meet different situations.

4. Test of Hypothesis Three revealed no significant difference between the proportions of superiors perceived to vary leadership style in the two studies.

5. Test of Hypothesis Four revealed no significant difference between the proportions perceived at the two managerial levels.

Research Question Three, which dealt with whether leaders vary leadership style with the nature of the problem, was examined in terms of three corollaries. The following results were observed:

6. Corollary A, which asked what proportions of respondents perceived that their superiors categorized problems as dichotomous pairs, was examined by test of Hypotheses Five, Six, and Seven. A clear majority of respondents (75.0 per cent or more) did not perceive superiors selecting leadership style on the basis of problems being dichotomous.

7. Test of Hypothesis Five revealed no significant difference between the proportions observed in the two studies.

8. Test of Hypotheses Six and Seven revealed no significant difference between the proportions observed at the two managerial levels in either study.

9. Corollary B, which asked about the proportions of respondents that perceived that their superiors categorized problems in terms of like problem attributes, was examined by test of Hypotheses Eight, Nine, and Ten. Subordinates perceived leaders to vary leadership style on the basis of using a single style for problems with technical attributes most frequently (58.1 per cent), interpersonal and simple



next most frequently (each 45.7 per cent), and complex least frequently (36.4 per cent).

10. Test of Hypothesis Eight revealed no significant difference between the proportions observed in the two studies.

11. Test of Hypotheses Nine and Ten revealed no significant difference between the proportions observed at the two managerial levels in either study.

12. Corollary C, which sought to avoid the overlap of results inherent in Corollary B, asked: What proportion of respondents in each style-flexibility group perceived superiors to place problems in each of the four categories of like problem attributes and in each of the two categories of an admixture of all problem attributes. Subordinates perceived leaders to vary leadership style on the basis of using a single style for problems with technical attributes most frequently (24.0 per cent), simple attributes (14.3 per cent), interpersonal attributes (14.0 per cent), and complex attributes (8.1 per cent). An additional number (16.3 per cent) of responses indicated that no dominant attribute was perceived by the respondent.

13. Test of Hypothesis Eleven revealed no significant difference between the proportions at the two managerial levels.

14. It was observed that as leadership style flexibility increased from SF-1 to SF-3, the proportion of managers perceived to use the same style for technical problems increased and the proportion for complex problems decreased, with no discernible pattern for simple and interpersonal problems.

The above is a summary of the results obtained by virtue of analysis of the data. The final chapter presents conclusions and their implications, of both a specific and general nature, based in part on these results. The following chapter presents an analysis of the results which bear directly on evaluation of leadership performance, satisfaction with superiors, and leadership style, each as related to leadership style flexibility.

## CHAPTER V

### ANALYSIS OF LEADERSHIP PERFORMANCE, LEADERSHIP SATISFACTION, AND LEADERSHIP STYLE DATA

#### Introduction

The results of the questionnaire survey which bear directly on evaluation of leadership performance, satisfaction with leadership, and leadership style, each as related to leadership style flexibility, are discussed in this chapter. Separate sections for each of the three topics present and analyze data as applied to the research question associated with the topic. As appropriate, the research questions are examined in terms of their associated hypotheses.

Some of the hypotheses were tested using the chi-square technique which required that the expected frequencies in each cell of the contingency table not be too small.<sup>1</sup> To insure that the results of the tests were interpretable within the context of each research question, it was necessary to avoid capricious combining of cells; i.e., it was necessary to use a logic that was consistent with the intent of the research and yet that met the statistical requirements.<sup>2</sup> The following

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<sup>1</sup>For chi-square tests with more than one degree of freedom, fewer than 20 per cent of the cells should have expected frequencies of less than 5, and no cell should have an expected frequency of less than 1, according to Siegel in Nonparametric Statistics, p. 174.

<sup>2</sup>Ibid., p. 178.



reasoning was applied to compress the five SF groups, identified in the previous chapter, into the four groups used in the remainder of this chapter:<sup>1</sup>

1. A small proportion of all respondents (1.3 per cent) perceived their superiors to use a different style for each of four problems, i.e., to have high style flexibility (SF-4).

2. More than one-third of the respondents (the 34.1 per cent in group SF-3) perceived their superiors to use three different styles (a single style for two problems and two different styles for the remaining two problems); i.e., they perceived superiors to use slightly less style flexibility than SF-4.

3. Merger of the SF-4 and SF-3 responses formed a new group (SF-3 & 4) which retained the high style-flexibility characteristic.

4. The new group (SF-3 & 4) retained the relative position of its constituent groups; i.e., the consolidated group possessed higher style flexibility than SF-0, SF-1, and SF-2; a situation consistent with the objective of identifying possible relationships between style flexibility and performance, satisfaction, and leadership style.

The following sections discuss leadership performance as related to leadership style flexibility, leadership satisfaction as

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<sup>1</sup>The five SF groups stemmed from subordinates perceiving superiors choosing one of four leadership styles for each of four situations. This permitted identification of five degrees of style flexibility. The degrees of style flexibility ranged from rigid (use of same style for four situations, i.e., SF-0) to flexible (use of different style for each situation, i.e., SF-4). Intermediate levels of flexibility were SF-1 (one style in three situations and a different style in the fourth situation), SF-2 (two different styles with each style used in two situations), and SF-3 (three different styles with one style used twice and the other two styles each used once).

related to leadership style flexibility, and the comparison of the results of the current study with the corresponding observations of Hill. A final section discusses leadership style as related to leadership style flexibility. A summary of these sections is provided at the end of the chapter.

### Leadership Performance and Style Flexibility

Performance evaluation data were examined in the search for an answer to Research Question Four. The following sections provide a presentation of the data, an analysis of the data, an analysis of Research Question Four, a statement of Hill's findings regarding the research question, and a summary of results pertaining to the question of whether perceived flexibility is related to performance situations of subordinates by superiors.

#### Presentation of Data

Respondents in the current study were evaluated by their superiors. The evaluation device used consisted of separate performance evaluation instruments (Part One and Part Two of the Performance Evaluation Questionnaire shown in Appendix A). The evaluation scores which resulted from use of these instruments are summarized in Table 18. Frequency tables, for each instrument, which show by SF groups the number of evaluation scores in specific rating intervals were prepared to expedite analysis of the data. The reasoning used to establish intervals for the two frequency tables is discussed in the following paragraphs.

TABLE 18  
PERFORMANCE EVALUATION DATA SUMMARY

Group SF-0			Group SF-1			Group SF-2			Group SF-3			Group SF-3 (cont.)			Group SF-4		
Resp. Ident. No.	Score on Instrument		Resp. Ident. No.	Score on Instrument		Resp. Ident. No.	Score on Instrument		Resp. Ident. No.	Score on Instrument		Resp. Ident. No.	Score on Instrument		Resp. Ident. No.	Score on Instrument	
3	91	24	4	126	40	19	125	40	1	60	20	74	55	18	6	86	22
5	116	31	11	35	13	21	112	30	2	92	25	75	84	29	101	63	21
13	123	34	12	102	30	25	88	31	7	64	23	82	82	21			
15	126	31	17	105	32	31	113	30	8	126	40	87	60	31			
16	114	31	22	121	35	34	105	33	9	101	36	89	76	23			
30	73	15	26	109	33	37	117	29	10	102	30	97	108	31			
36	126	40	28	117	38	45	78	35	14	60	20	100	68	21			
51	85		39	94	28	47	97	23	18	30	15	105	72	23			
57	*	35	41	71	25	50	63	20	20	126	38	106	102	29			
59	117	33	42	78	28	54	108	35	23	124	39	107	103	27			
62	121	35	43	126	40	56	55	23	24	55	23	115	47	17			
65	89	29	52	106	33	61	66	17	27	85	25	119	112	33			
66	107	29	60	101	36	69	70	24	29	91	28	120	111	25			
67	92	30	64	69	20	70	117	35	32	110	27	123	50	30			
76	80	26	77	126	34	73	72	26	33	75	23	129	73				
79	32	18	78	63	23	80	91	29	35	97	30						
88	111	32	84	95	31	81	93	27	38	90	22						
91	59	18	85	77	25	83	61	13	40	70	20						
95	126	40	92	93	17	86	74	17	44	101	27						
99	85	26	96	63	17	90	89	34	46	111	33						
109	91	25	98	105	30	93	89	30	48	76	25						
110	78	18	102	72	18	94	88	27	49	110	40						
112	99	20	104	88	25	103	29*	17	53	70	29						
113	80	25	111	118	31	108	92	29	55	50	13						
114	63	17	116	106	23	117	36	18	58	121	33						
124	97	19	122	99	35	118	114	31	63	114	34						
126	112	38				121	84	21	68	88	29						
128	60	14				125	90	37	71	111	29						
						127	108	30	72	32	16						

\*No response.

Part One (the first instrument) asked the rater to rank six criteria by numbering the criteria in order of importance to the assignment of the individual being rated. The rater was also asked to evaluate how well the individual performed by placing a mark for each criteria in one of six rating columns. For purposes of scoring, the columns and criterion were numbered from one to six. Individual scores were calculated as the sum of the six products formed by multiplying the rank (criteria) number by the rating (performance) number for each column. The maximum possible score in the first column (which indicated unsatisfactory performance) was attained if all cells in the first column were checked; i.e., the score was  $(6 \times 1) + (5 \times 1) + (4 \times 1) + (3 \times 1) + (2 \times 1) + (1 \times 1) = 21$ ; a lesser score was possible if the rater declined to mark any of the six criteria. The number 21 served as the maximum value in the first interval, i.e., (0-21). Subsequent intervals extended from one plus the maximum in the prior column to the maximum possible in the column. The remaining intervals for Part One were (22-42), (43-63), (64-84), (85-105), and (106-126).

The intervals for Part Two (Second Instrument) scores were established using the same reasoning. In Part Two the rater was asked to rate the individual in terms of eight rating factors and five degrees of performance (five rating columns). For purposes of scoring, the columns were numbered from one to five starting from the left (i.e., the least satisfactory end of the scale). Individual scores were calculated as the sum of the products obtained by multiplying the number of marks in a column by the number at the top of the column.



TABLE 19  
FREQUENCY TABLES  
STYLE FLEXIBILITY - PERFORMANCE RATING

Part I (First Instrument)

Rating Intervals: 0-21		22-42		43-63		64-84		85-105		106-126		Totals		
SF-Group	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SF-0	0	-	1	(0.8)	3	(2.3)	9	(7.0)	3	(2.3)	11	(8.6)	27*	(21.1)
SF-1	0	-	1	(0.8)	3	(2.3)	5	(3.9)	7	(5.5)	10	(7.8)	26	(20.3)
SF-2	0	-	2	(1.6)	5	(3.9)	10	(7.8)	4	(3.1)	8	(6.2)	29	(22.6)
SF-3 & 4	0	-	3	(2.3)	12	(9.4)	12	(9.4)	7	(5.5)	12	(9.4)	46	(35.9)
Totals	0	-	7	(5.5)	23	(17.9)	36	(28.1)	21	(16.4)	41	(32.0)	128	(99.9)

Part II (Second Instrument)

Rating Intervals: 0-8			9-16		17-24		25-32		33-40		Totals	
SF-Group	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SF-0	0	-	2	(1.6)	8	(6.2)	11	(8.5)	7	(5.4)	28	(21.7)
SF-1	0	-	1	(0.8)	5	(3.9)	11	(8.5)	9	(7.0)	26	(20.1)
SF-2	0	-	1	(0.8)	9	(7.0)	12	(9.3)	7	(5.4)	29	(22.5)
SF-3 & 4	0	-	3	(2.3)	15	(11.6)	18	(13.9)	10	(7.8)	46	(35.7)
Totals	0	-	7	(5.4)	37	(28.7)	52	(40.3)	33	(25.6)	129	(100.0)

NOTE: \*No response for respondent 57.

Percentages are based on the total number of responses indicated for each instrument.

A score of eight was possible if all marks were in the first column, that is, eight marks times the number one; a lesser score was possible if the rater declined to mark any of the eight rating factors. The figure eight served as the maximum value in the first interval (0 to 8), an interval viewed as corresponding to the first column (which indicated unsatisfactory performance). Subsequent intervals extended from one plus the maximum in the prior column to the maximum possible in the column. The remaining intervals for Part Two were (9-16), (17-24), (25-32), and (33-40), as shown in Table 19.

The following sections provide an analysis of the fourth research question and its associated hypothesis in terms of data presented in Table 18 and Table 19.

#### Research Question Four

The fourth research question asked: Is perceived flexibility related to performance evaluations of subordinates by superiors? The response to this question involved further analysis of data presented in Table 18 and Table 19, and analysis of the research question in terms of Hypothesis Twelve and Hypothesis Thirteen.

#### Analysis of Data

Table 19 summarized, for both instruments, the number of evaluation scores in each of the rating intervals. Review of variations in the proportions of the evaluation scores in the rows of cells associated with the intervals, indicated the following:

1. The proportion of scores in each interval of the first instrument increased as the score increased toward outstanding

performance except for the dip in the (85-105) interval (which indicated superior performance). The same pattern was observed for each SF group, except for SF-1 where there was an uninterrupted increase from first to last interval.

2. The proportion of evaluations in each interval of the second instrument increased as the score increased except for the dip in the final interval (which indicated the highest level of performance). The same pattern was observed for each SF group.

The majority of scores indicated by both instruments was in the upper intervals; i.e., they were high evaluations.<sup>1</sup> As illustrated in the histogram presented in Figure 6, more than three-quarters (76.5 per cent) of first instrument scores, and two-thirds of second instrument scores (65.9 per cent) were in the intervals associated with the highest levels of performance.

A more direct comparison of the two sets of performance evaluation scores was made possible by merging adjacent interval columns shown in Figure 6 into the three columns for each instrument shown in Figure 7. Merger of the intervals was based on the following considerations:

1. Both sets of scores reflected a superior's evaluation of a subordinate supervisor's performance expressed in terms ranging from unsatisfactory to outstanding.

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<sup>1</sup>High evaluations have become the rule in the U.S. Air Force and U.S. Army according to Ed Gates in "Rating the Effectiveness of Effectiveness Rating" in Air Force Magazine, September, 1975, pp. 54-55. He reported that in 1971, in the U.S. Air Force, the mean score for a group of 70,000 officers (first-level managers) was greater than eight on a scale where nine was perfect; and the mean score for an additional 45,000 officers (middle level managers) was 8.5 on the same scale. By 1974, ninety per cent of all officers were rated at the nine level.

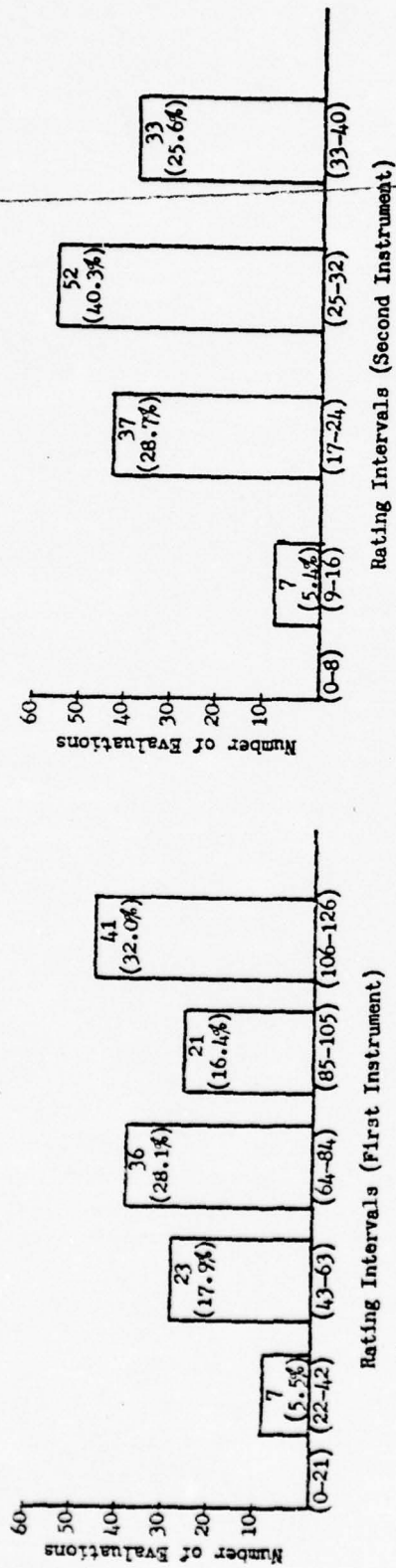


Figure 6. Histogram of Distribution of Performance Evaluation Scores

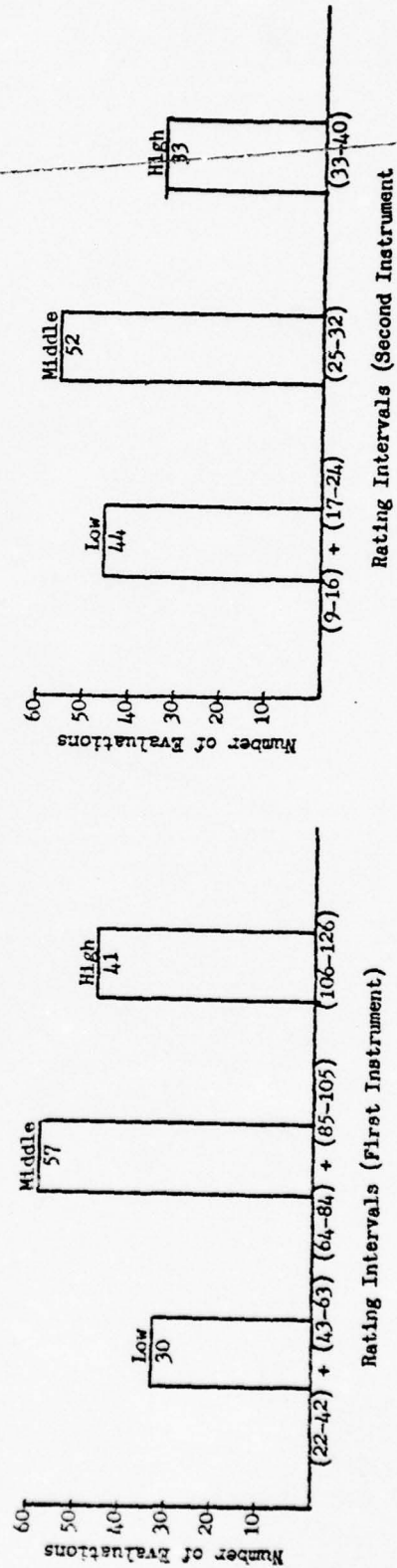


Figure 7. Histogram of Distribution of Performance Evaluation Scores Among Low, Middle and High Intervals



2. Both instruments presented a continuum of possible choices, which was assigned numerical intervals in the current study. Merger of adjacent intervals had the effect of encompassing a larger portion of a gradient from unsatisfactory to outstanding. As a consequence of the merger of adjacent intervals, the two patterns of distribution of scores (shown in Figure 7) were observed to be consistent to the extent that in both cases the majority of evaluations was in the middle intervals, with lesser numbers in the high and low intervals.

The following section presents an examination of the fourth research question using the distribution of data illustrated in Figure 7 as the basis for the examination.

#### Analysis of Research Question Four

As indicated earlier, the fourth research question asked: Is perceived flexibility related to performance evaluation of subordinates by superiors? The response to this question involved testing Hypothesis Twelve utilizing the data distribution illustrated in Figure 7. Hypothesis Thirteen was tested utilizing data presented earlier in Table 18, to determine if there was a significant difference between performance rating scores obtained by use of each of the two instruments.

#### Test of Hypothesis Twelve

An answer to the fourth research question required a determination of whether perceived flexibility was related to leadership performance evaluation scores as measured by each of the two performance instruments. This determination involved two tests of Hypothesis Twelve; first with data collected using the first instrument and then

with data collected employing the second instrument. The tests involved preparation of separate "style flexibility - performance" frequency tables for each set of data. Table 20 presents the frequency tables (based on the distribution illustrated in Figure 7) used to test the hypothesis.

Since the data consisted of frequencies in discrete categories (the number of evaluation scores in each SF group found to fall within each of the rating intervals), the chi-square test for determining the significance of differences between independent groups was used.<sup>1</sup> The hypothesis tested stated:

$H_0$ : Regarding the effectiveness rating scores of supervisors using varying degrees of leadership style flexibility, the proportion of supervisors evaluated to be in each of the performance intervals is the same in all style-flexibility groups.

$H_a$ : Regarding the effectiveness rating scores of supervisors using varying degrees of leadership style flexibility, the proportion of supervisors evaluated to be in each of the performance intervals is not the same in all style-flexibility groups.

The test of this hypothesis is summarized in Table 21; the chi-square test procedure is described in Appendix N. From the evidence (both from the first and second instruments) the null hypothesis cannot

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<sup>1</sup>Siegel, Nonparametric Statistics, pp. 174-179.

TABLE 20

FREQUENCY TABLE  
STYLE FLEXIBILITY - PERFORMANCE RATING  
LOW, MIDDLE, AND HIGH INTERVALS

Part I, First Instrument									
SF Group	(22 to 63)		Rating Intervals				(106 to 126)		Totals
	No.	%	(64 to 105)		(106 to 126)		No.	%	
SF-0	4	(3.1)	12	(9.4)	11	(8.6)	27*	(21.1)	
SF-1	4	(3.1)	12	(9.4)	10	(7.8)	26	(20.3)	
SF-2	7	(5.5)	14	(10.9)	8	(6.2)	29	(22.6)	
SF-3 & 4	15	(11.7)	19	(14.8)	12	(9.4)	46	(35.9)	
Totals	30	(23.4)	57	(44.5)	41	(32.0)	128	(99.9)	
Part II, Second Instrument									
SF Group	(9 to 24)		Rating Intervals				(33 to 40)		Totals
	No.	%	(25 to 32)		(33 to 40)		No.	%	
SF-0	10	(7.8)	11	(8.5)	7	(5.4)	28	(21.7)	
SF-1	6	(4.7)	11	(8.5)	9	(7.0)	26	(20.2)	
SF-2	10	(7.8)	12	(9.3)	7	(5.4)	29	(22.5)	
SF-3 & 4	18	(13.9)	18	(13.9)	10	(7.8)	46	(35.6)	
Totals	44	(34.2)	52	(40.2)	33	(25.6)	129	(100.0)	

NOTES: \*No evaluation for respondent #57.

Percentages are based on the total number of responses indicated for each instrument.

TABLE 21

## TEST OF HYPOTHESIS TWELVE

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Null ( $H_0$ ): The proportion of supervisors evaluated to be in each of the performance intervals is the same in all SF-groups.

Alternative ( $H_a$ ): The proportion of supervisors evaluated to be in each of the performance intervals differs from SF-group to SF-group.

Using Data from First Instrument:

Significance Level: 0.05, 6 d.f.

Statistical Test:  $\chi^2$

Decision Rule

Reject  $H_0$  if:  $\chi^2_{0.05} (6) > 12.59$

Test Data: See Table 20

Calculated Value:  $\chi^2 = 5.10845$

Decision: Cannot reject  $H_0$  at specified level of significance.

Using Data from Second Instrument:

Significance Level: 0.05, 6 d.f.

Statistical Test:  $\chi^2$

Decision Rule

Reject  $H_0$  if:  $\chi^2_{0.05} (6) > 12.59$

Test Data: See Table 20

Calculated Value:  $\chi^2 = 2.46954$

Decision: Cannot reject  $H_0$  at specified level of significance.

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be rejected at the chosen level of significance; therefore, the null hypothesis, i.e., that the proportion of supervisors evaluated to be in each of the performance intervals is the same in all style-flexibility groups, is accepted.

#### Test of Hypothesis Thirteen

This hypothesis was tested to determine if there was a significant difference between the performance ratings obtained by each of the two instruments. The Spearman rank correlation coefficient ( $\gamma_s$ ) was used as a measure of association between the two sets of data; and the significance of  $\gamma_s$  was tested using the null hypothesis that the two sets of scores were not associated in a population, and that the observed value of  $\gamma_s$  differed from zero only by chance. The scores from the instruments were ranked in two ordered series to permit calculation of  $\gamma_s$ . The hypothesis tested stated that:

$H_0$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility, the performance ratings as determined by the first instrument and the performance ratings as determined by the second instrument are unrelated in the population; i.e., they are not associated in the population of scores.

$H_a$ : Regarding the effectiveness ratings of supervisors using varying degrees of leadership style flexibility the performance ratings as determined by the first instrument and the performance ratings as determined by the second instrument are related in the population; i.e., they are associated in the population of scores.

The calculation of the Spearman rank correlation coefficient and the test of this hypothesis are summarized in Table 22; the procedure is briefly described in Appendix N.<sup>1</sup> From the evidence, the null hypothesis cannot be accepted at the specified level of significance; therefore, the alternative hypothesis; i.e., that the two instruments are related in the population of scores, is accepted.

#### Hill's Findings

Hill found that no one degree of style flexibility by itself appeared to be related to higher effectiveness ratings.<sup>2</sup>

#### Summary

Effectiveness ratings as determined by the first instrument and as determined by the second instrument were found to be associated in the population from which the sample was drawn.

The majority of evaluation scores (more than 94 per cent) was observed to be at the high end of the scale, with no evaluations observed at the low end of the scale. The proportions of supervisors evaluated to be in each of the performance intervals was found to be the same in all SF groups. This finding was consistent with Hill's report that no one degree of style flexibility by itself appeared to be related to higher effectiveness ratings. Effectiveness ratings as determined by the first instrument and as determined by the second

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<sup>1</sup>A more complete discussion is presented in Siegel, Non-parametric Statistics, pp. 202-213.

<sup>2</sup>Hill, "Leadership Style," p. 78.

TABLE 22

## TEST OF HYPOTHESIS THIRTEEN

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The value of  $r_s$  was computer calculated using a program from the Statistical Package for the Social Sciences (SPSS)<sup>1</sup> and data presented in Table 18. There were 128 cases with two variables in each case (i.e., scores from each of the two instruments). The calculated value of the Spearman Coefficient was found to be  $r_s = 0.8183$ .

Testing Significance of  $r_s$ .

$H_0$ : The performance ratings determined by the first instrument and the performance ratings determined by the second instrument are not associated in the population of scores.

$H_a$ : The performance ratings determined by the first instrument and the performance ratings determined by the second instrument are associated in the population of scores.

Significance Level: 0.05  
 Statistical Test:  $t$  where  $t = r_s \sqrt{\frac{N-2}{1-r_s^2}}$  and  $df = N-2$

Decision Rule  
 Reject  $H_0$  if:  $t_{0.05} (126) > 1.658$   
 (.025 for one-tailed test)

Test Data: See Table 18

Calculated Value:  $t = 0.8183 \sqrt{\frac{128-2}{1-(.8183)^2}} = 5.282$

Decision: Reject  $H_0$  at specified level of significance and conclude that the observed association represents a relation in the population of scores.

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NOTE: <sup>1</sup> The method of calculation and test of significance is illustrated in Appendix N. A more complete discussion is presented in Siegel, Nonparametric Statistics, pp. 202-213.

instrument were found to be associated in the population of scores from which the sample was drawn; i.e., there was no significant difference between the performance ratings obtained by each of the two instruments.

### Leadership Satisfaction and Style Flexibility

The leadership-satisfaction data presented in Table 23 were examined in the search for an answer to Research Question Five. The following sections provide a presentation of the data, an analysis of the data, an analysis of Research Question Five, a statement of Hill's findings regarding the research question, and a summary of results pertaining to the question of whether perceived style flexibility is related to subordinates' satisfaction with superiors.

#### Presentation of Data

Respondents in the current study expressed their satisfaction with leadership received through the use of the Job Descriptive Index presented earlier as part of Appendix A. The scores observed are summarized in Table 23. A frequency table which shows (by SF groups) the number of scores in specific intervals is discussed in the following paragraphs.

The instrument (Job Descriptive Index) asked the respondent to indicate whether each of a list of eighteen adjectives and short phrases applied to his job situation. If a word or phrase described the supervision received, he was asked to answer "yes", if not to answer "no", and if undecided to place a question mark in the space provided. Some of the items were positive in nature (e.g., asks my



TABLE 23

LEADERSHIP SATISFACTION DATA SUMMARY  
STYLE FLEXIBILITY GROUP

SF-0		SF-1		SF-2		SF-3		SF-4	
No.	Score	No.	Score	No.	Score	No.	Score	No.	Score
3	26	4	42	19	16	1	22	6	54
5	12	11	27	21	54	2	50	101	37
13	54	12	33	25	50	7	31		
15	34	17	50	31	32	8	52		
16	52	22	51	34	49	9	30		
30	54	26	51	37	24	10	48		
36	54	28	32	45	43	14	51		
51	31	39	41	47	54	18	52		
57	37	41	27	50	49	20	37		
59	29	42	41	54	42	23	37		
62	19	43	49	56	39	24	28		
65	35	52	50	61	52	27	34		
66	16	60	18	69	31	29	50		
67	54	64	40	70	54	32	36		
76	11	77	43	73	33	33	28		
79	26	78	51	80	20	35	52		
88	36	84	54	81	31	38	46		
91	38	85	52	83	43	40	42		
95	15	92	42	86	34	44	*		
99	18	96	48	90	35	46	51		
109	20	98	*	93	28	48	32		
110	28	102	32	94	25	49	54		
112	42	104	33	103	30	53	42		
113	39	111	35	108	49	55	48		
114	40	116	48	117	41	58	46		
124	18	122	46	118	51	63	45		
126	7			121	51	68	39		
128	52			125	26	71	19		
				127	49	72	27		
						74	51		
						75	34		
						82	42		
						87	54		
						89	44		
						97	42		
						100	32		
						105	54		
						106	31		
						107	31		
						115	25		
						119	49		
						120	39		
						123	35		
						129	49		

NOTES: \*No response for  
#98 and #44.

advice); other items were negative in nature (e.g., hard to please). The system of weights devised by Smith, Kendall, and Hulin for use with this instrument was employed for purposes of scoring.<sup>1</sup> A "yes" answer to a positive item, or a "no" answer to a negative item was given a score of three points. A "no" answer to a positive item or a "yes" answer to a negative item was given a score of zero points. Undecided answers (question marks) were given a score of one point.

The minimum score, zero, occurred when all positive items had a "no" answer and all negative items had a "yes" answer. The maximum score of fifty-four occurred if the reverse were true. If all items had a question mark, a point of indifference with a score of eighteen occurred.<sup>2</sup> These three points, 0, 18, and 54, were used by the writer in conjunction with mean and standard deviation values for over two thousand employees in twenty-one different companies to construct the following five intervals.<sup>3</sup>

1. The first interval (0-18) extended from the minimum possible score to the point of indifference.

2. The second interval (19-30) extended from one plus the maximum in the first interval to one less than the minimum value in the third interval.

3. The extremes of the third interval (31-41) were formed by the mean and the mean minus one standard deviation.

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<sup>1</sup>Smith, Kendall, and Hulin, p. 79.

<sup>2</sup>Ibid., p. 81.

<sup>3</sup>A mean of 41 and standard deviation of 10 (rounded numbers) were reported by Smith, Kendall, and Hulin, p. 80.

4. The extremes of the fourth interval (42-51) were formed by one plus the maximum in the third interval and the mean plus one standard deviation.

5. The fifth interval (52-54) extended from one plus the maximum in the fourth interval to the maximum possible score.

These intervals were used to prepare the frequency table presented in Table 24.

The following sections provide an analysis of the fifth research question and its associated hypothesis in terms of the data presented in Table 23.

#### Research Question Five

The fifth research question asked: Is perceived flexibility related to subordinates' satisfaction with superiors? The response to this question involved further analysis of data presented in Table 23, and the testing of Hypothesis Fourteen.

#### Analysis of Data

Table 24 summarizes the number of satisfaction scores in each of the rating intervals. Review of the proportions of satisfaction scores in the rows of cells (a row for each SF group and one for "Totals") associated with the intervals, indicated the following variations:

1. Data in the "Totals" row indicates that the proportion of satisfaction scores in each interval increased as the score increased, with a decrease in the last interval (which indicated greatest satisfaction).

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NOTES: \*No response for respondent 98.  
 \*\*No response for respondent 44.  
 Percentages are based on the total number of responses.



2. The proportion of satisfaction scores in the SF-1, SF-2, and SF-3 & 4 rows followed the same pattern.

3. The proportion of satisfaction scores in the SF-0 row did not conform to the above pattern. Approximately one-half (46 per cent) of the respondents who perceived their superiors as being in SF-0 (least flexible) indicated low levels of satisfaction with supervision received.

The majority of satisfaction scores (76.3 per cent) was in the three intervals indicating greatest satisfaction; a small number (7.1 per cent) were at or below the point of indifference (a question mark for each item, i.e., a score of 18). This distribution of satisfaction scores among intervals is illustrated in the histogram presented in Figure 8.

The histogram presented in Figure 8, designed to emphasize graphically the distribution of scores among five intervals, did not show a response pattern that was sufficiently concentrated for use in statistical testing. This required merging interval columns using a logic consistent with the nature of the instrument employed. As discussed in the preceding section, the scores represented degrees of satisfaction with supervision received. The range of possible scores represented a continuum of degrees of leadership satisfaction which was arranged in numerical intervals in the current study. Adjacent intervals were merged to form the concentrated pattern illustrated in Figure 9.

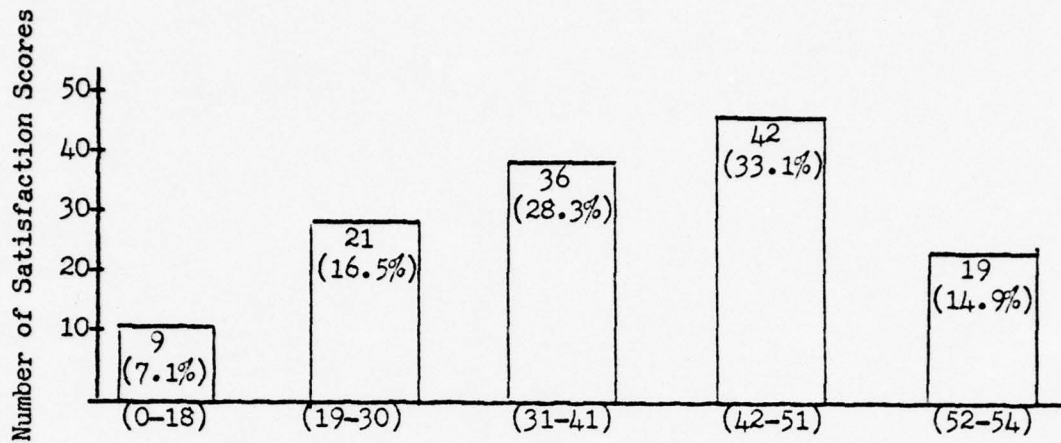


Figure 8. Histogram of Distribution of Leadership Satisfaction Scores

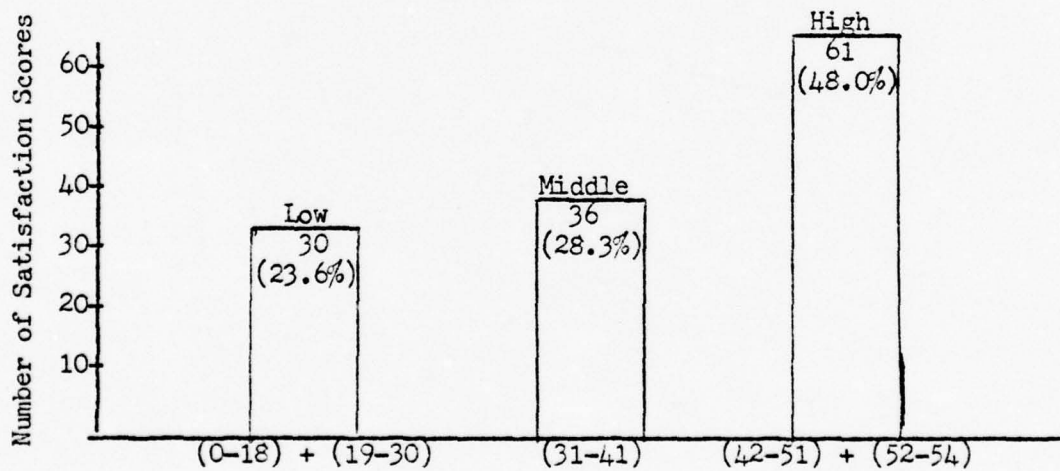


Figure 9. Histogram of Distribution of Leadership Satisfaction Scores Among Low, Middle and High Intervals

The following section presents an examination of the fifth research question using the distribution of data illustrated in Figure 9 as the basis for the examination.

#### Analysis of Research Question Five

As indicated earlier the fifth research question asked: Is perceived flexibility related to subordinates' satisfaction with superiors? The response to this question involved testing of Hypothesis Fourteen using the frequency table presented in Table 25.

#### Test of Hypothesis Fourteen

An answer to the fifth research question require a determination of whether perceived flexibility was related to subordinates' satisfaction with superiors, as measured by the Job Descriptive Index. This determination involved a test of Hypothesis Fourteen employing data gathered through the use of the Job Descriptive Index. Table 25 presents the frequency tables, based on the distribution of leadership satisfaction scores illustrated in Figure 9, used in the test.

Since the data consisted of frequencies in discrete categories (the number of satisfaction scores in each SF group found to fall within each of the score intervals) the chi-square test for determining the significance of differences between independent groups was used.<sup>1</sup> The hypothesis tested stated that:

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<sup>1</sup>Siegel, Nonparametric Statistics, pp. 174-179.

TABLE 25

FREQUENCY TABLE  
STYLE FLEXIBILITY - LEADERSHIP SATISFACTION  
LOW, MIDDLE, AND HIGH INTERVALS

SF-Group	Satisfaction Intervals								Totals
	Low		Middle		High		No.	%	
	(0 to 18) + (19 to 30)	(31 to 41)	(42 to 51) + (52 to 54)	No.	%				
SF-0	No. 13	% (10.2)	No. 8	% (6.3)	No. 7	% (5.5)	28	(22.0)	
SF-1	No. 3	% (2.4)	No. 6	% (4.7)	No. 16	% (12.6)	25	(19.7)	
SF-2	No. 7	% (5.5)	No. 8	% (6.3)	No. 14	% (11.0)	29	(22.8)	
SF-3 & 4	No. 7	% (5.5)	No. 14	% (11.0)	No. 24	% (18.9)	45	(35.4)	
Totals	No. 30	% (23.6)	No. 36	% (28.3)	No. 61	% (48.0)	127	(99.9)	

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NOTE: Percentages based on total number of responses.



- $H_0$ : Regarding subordinates' satisfaction with superiors perceived to use varying degrees of leadership style flexibility, the proportion of supervisors observed to be in each of the satisfaction intervals is the same in all style-flexibility groups.
- $H_a$ : Regarding subordinates' satisfaction with superiors perceived to use varying degrees of leadership style flexibility, the proportion of supervisors observed to be in each of the satisfaction intervals is not the same in all style-flexibility groups.

The test of this hypothesis is summarized in Table 26; the chi-square test procedure is described in Appendix N. From the evidence the null hypothesis cannot be accepted at the chosen level of significance; therefore, the alternative hypothesis, i.e., that the proportion of supervisors observed to be in each of the satisfaction intervals is not the same in all style-flexibility groups, is accepted.

#### Hill's Findings

Hill found that subordinates expressed more satisfaction with their supervisors when they perceived them to have the highest degree of style flexibility; i.e., subordinates were significantly more satisfied with their superiors when they perceived them to possess high style flexibility.

TABLE 26

## TEST OF HYPOTHESIS FOURTEEN

Hypothesis:  $H_0$ : The proportion of supervisors observed to be in each of the satisfaction intervals is the same in all SF groups.

$H_a$ : The proportion of supervisors observed to be in each of the satisfaction intervals differs from SF group to SF group.

Significance Level: 0.05, 6 d.f.

Statistical Test:  $\chi^2$

Decision Rule  
Reject  $H_0$  if:  $\chi^2_{0.05} (6) > 12.59$

Test Data (from Table 25):

13	8	7
3	6	16
7	8	14
7	14	24

Calculated Value:  $\chi^2 = 13.81525$

Decision: Cannot accept the null hypothesis at the chosen level of significance.

### Summary

The majority of satisfaction scores (76.3 per cent) were observed in the three intervals indicating greatest satisfaction; a small number (7.1 per cent) were observed to be at or below the point of indifference. The proportion of supervisors observed to be in each of the satisfaction intervals was not the same in all SF groups. Specifically, the distribution of satisfaction scores in the SF-0 group did not conform to the pattern of change observed for the other groups (SF-1, SF-2, SF-3 & 4) or with the total for all groups. Approximately one-half (46 per cent) of the respondents who perceived their superiors as being in SF-0 (least flexible) indicated low levels of satisfaction with supervision received. While Hill also found that the proportion of supervisors observed to be in each of the satisfaction intervals was not the same in all SF groups; he observed that subordinates expressed more satisfaction with their supervisors when they perceived them to be in SF-4 (most flexible).

### Leadership Style and Leadership Style Flexibility

Leadership style data, as measured by the Least-Preferred-Coworker instrument, were examined in the search for an answer to Research Question Six. The following sections provide a presentation of the data, an analysis of the data, an analysis of Research Question Six, and a summary of results pertaining to the question of whether perceived flexibility is related to Least-Preferred-Coworker scores.

## Presentation of Data

Respondents in the current study expressed their perception of their leaders' style of leadership through the use of the Least-Preferred-Coworker Instrument presented earlier as part of Appendix A. The scores observed are summarized in Table 27. A frequency table which shows (by SF group) the number of LPC scores in specific intervals is discussed below.

The instrument (Least-Preferred-Coworker) asked the respondent to consider sixteen pairs of bipolar adjectives in turn; and, for each pair, to place an (X) in the one of eight spaces that was most descriptive of the person in his working life with whom he had been able to cooperate least well. The most favorable position in the scale was assigned a weight of eight points and each intermediate position a lesser score down to a single point for the least favorable response. The score was generated as the average of the sum of the sixteen individual item scores.

The minimum score, one, occurred if all items were marked in the least favorable position. The maximum score, eight, occurred if the reverse were true, i.e., if all items were marked in the most favorable position. These two extreme points (one and eight) were used in conjunction with the range of values for high and low-LPC scores to construct the following five intervals.<sup>1</sup>

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<sup>1</sup>Low-LPC scores, indicative of task-oriented respondents, run from about 1.2 to 2.2; high-LPC scores, indicative of relationship-oriented respondents, range from about 4.1 to 5.7, according to Fiedler, Leadership Effectiveness, p. 44.



TABLE 27

## LEAST-PREFERRED-COWORKER DATA

SF-0		SF-1		SF-2		SF-3		SF-4	
No.	Score	No.	Score	No.	Score	No.	Score	No.	Score
3	6.25	4	5.00	19	5.81	1	4.25	6	4.75
5	2.69	11	5.44	21	1.94	2	2.35	101	4.38
13	1.00	12	4.19	25	5.13	7	4.06		
15	6.38	17	3.69	31	4.06	8	6.75		
16	5.31	22	5.20	34	1.56	9	4.75		
30	1.00	26	4.19	37	4.00	10	4.13		
36	3.63	28	3.19	45	3.19	14	3.81		
51	3.44	39	5.75	47	6.38	18	4.19		
57	4.50	41	4.50	50	4.00	20	4.19		
59	4.75	42	4.50	54	3.56	23	4.25		
62	3.06	43	4.75	56	4.19	24	3.06		
65	1.88	52	4.06	61	5.25	27	5.75		
66	2.56	60	4.00	69	4.44	29	7.56		
67	5.00	64	3.31	70	4.69	32	4.81		
76	3.75	77	4.06	73	3.75	33	3.13		
79	4.31	78	4.88	80	3.56	35	2.56		
88	4.44	84	4.50	81	1.25	38	3.19		
91	4.69	85	3.06	83	5.94	40	3.19		
95	3.06	92	2.56	86	4.50	44	2.44		
99	3.44	96	3.63	90	3.25	46	3.19		
109	3.19	98	3.06	93	3.19	48	1.75		
110	4.81	102	4.13	94	3.33	49	3.56		
112	4.69	104	3.00	103	4.38	53	3.56		
113	4.69	111	2.75	108	4.81	55	2.44		
114	2.50	116	3.81	117	3.89	58	4.00		
124	5.63	122	3.75	118	3.19	63	5.50		
126	4.88			121	4.31	68	1.00		
128	4.38			125	2.75	71	3.50		
				127	3.00	72	2.94		
						74	5.44		
						75	4.69		
						82	2.38		
						87	3.44		
						89	3.94		
						97	3.25		
						100	3.63		
						105	2.94		
						106	4.19		
						107	4.13		
						115	5.38		
						119	4.13		
						120	3.12		
						123	2.94		
						129	2.13		

1. The first interval (1-1.19) extended from the minimum possible score to just below the minimum score in the second interval.
2. The extremes of the second interval (1.2-2.2) were formed by the range of values for low-LPC scores (task-oriented respondents).
3. The third interval (2.21-4.09) extended from just above the second interval to just below the fourth interval.
4. The extremes of the fourth interval (4.1-5.7) were formed by the range of values for high-LPC scores (relationship-oriented respondents).
5. The fifth interval (5.71-8.0) extended from just above the fourth interval to the maximum possible score.

These intervals were used to prepare the frequency table presented in Table 28.

The following sections provide an analysis of the sixth research question and its associated hypothesis.

#### Research Question Six

The sixth research question asked: Is perceived flexibility (as determined by the Hill methodology) related to Least-Preferred-Coworker (LPC) scores (as determined by Fiedler's instrument)? The response to this question involved further analysis of data presented in Table 27 and Table 28 and the testing of Hypothesis Fifteen.

#### Analysis of Data

Table 28 summarized the number of LPC scores in each of the Leadership-Style intervals. Examination of the proportions of LPC scores in the rows of cells (a row for each SF group and one for

TABLE 28

FREQUENCY TABLE  
LEADERSHIP STYLE - STYLE FLEXIBILITY (FIVE INTERVALS)

SF-Group	Style Intervals (IPC)										Totals	
	(1-1.19)	(1.2-2.2)	(2.21-4.09)	(4.1-5.7)	(5.71-8.0)						No.	%
SF-0	No. 2 (1.6)	No. 1 (.8)	No. 10 (7.8)	No. 13 (10.1)	No. 2 (1.6)						28	(21.7)
SF-1	0 (0)	0 (0)	14 (10.8)	11 (8.5)	1 (.8)						26	(20.2)
SF-2	0 (0)	3 (2.3)	14 (10.8)	9 (7.0)	3 (2.3)						29	(22.5)
SF-3 & 4	1 (.8)	1 (.8)	25 (19.4)	16 (12.4)	3 (2.3)						46	(35.7)
Totals	3 (2.4)	5 (3.9)	63 (48.8)	49 (38.0)	9 (7.0)						129	(100.0)

NOTE: Percentages based on the total number of responses.

"Totals") associated with the intervals indicated the following variations:

1. Data in the "Totals" row indicated that the proportion of LPC scores increased in the first three intervals, reached a maximum in the third interval, and decreased in the last two intervals.

2. The proportion of LPC scores, in all SF groups, except SF-0, was maximum in the third interval (the interval between high and low-LPC scores).

3. A small number of LPC scores (3.9 per cent) was in the low-LPC interval (1.2-2.2); a group about ten times this number (38 per cent) was in the high-LPC interval (4.1-5.7). No pattern of change of high and low-LPC scores among the SF groups was identifiable; nor was a change pattern identifiable when the first interval and low-LPC scores, and the fifth interval and high-LPC scores were merged.

4. The greatest number of scores was in the interval between the low-LPC and high-LPC intervals (48.8 per cent). In this middle interval the proportion of LPC scores increased as style flexibility increased from SF-0 to SF-4. The distribution of LPC scores among intervals is presented in Figure 10.

The histogram presented in Figure 10, designed to emphasize graphically the distribution of scores among five intervals, did not show a response pattern that was sufficiently concentrated for use in statistical testing. Additionally, it did not underscore the high proportion of scores in the region between high-LPC and low-LPC scores, a region of interest because of the limited knowledge about individuals



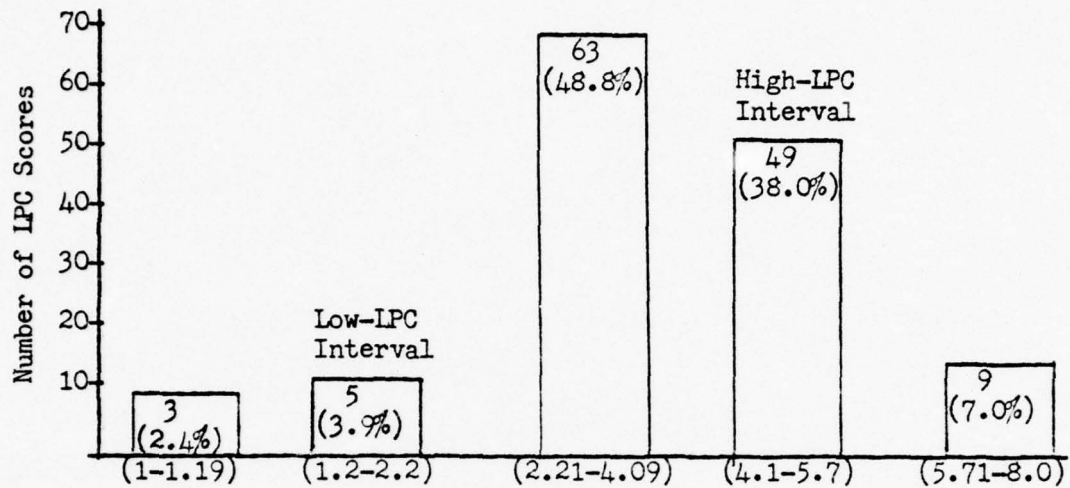


Figure 10. Histogram of Distribution of LPC Scores

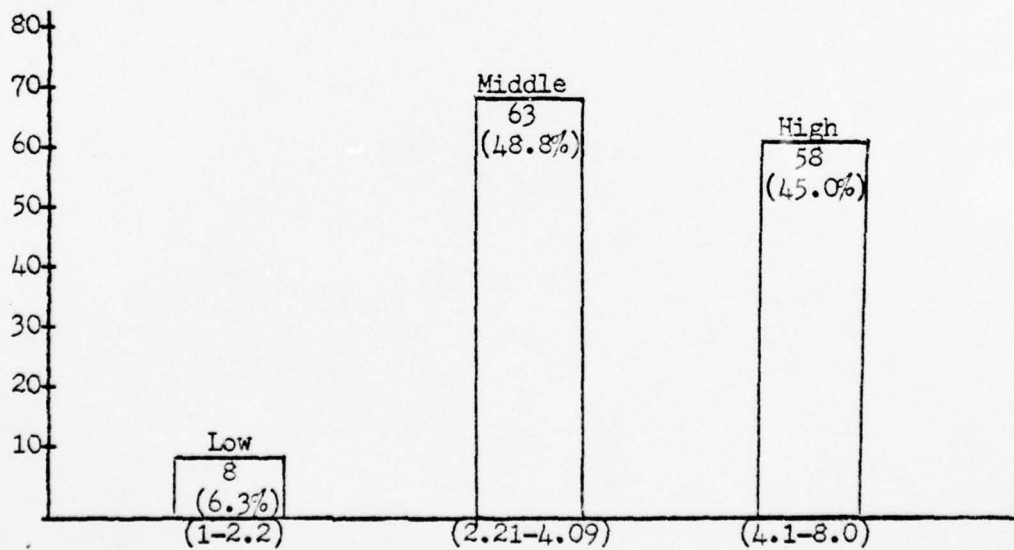


Figure 11. Histogram of Distribution of LPC Scores, Low, Middle and High Intervals

whose LPC score falls in this region.<sup>1</sup> Attainment of a concentrated distribution (shown in Figure 11) required merging interval columns using a logic consistent with the nature of the instrument employed. As discussed in the preceding section the scores represent subordinate supervisors' perceptions of their leaders' style of leadership. The range of possible scores represents a continuum of leadership styles which, in the current study, were arranged in numerical intervals. The low-LPC interval (1.2 to 2.2) and the first interval (1 to 1.19) were merged, as were the high-LPC interval (4.1 to 5.7) and the fifth interval (5.71 to 8). This new distribution, Figure 11, with three intervals, graphically emphasized that the vast majority of scores are well above the low-LPC interval (more than 93 per cent) and the greatest number of scores (48.8 per cent) are in the middle category.

Figure 12 presents a histogram formed by merging the relatively few (6.3 per cent) low and middle interval scores of Figure 11, into a new interval, which with the high interval of Figure 11, presents all scores in but two intervals. This merging of adjacent intervals in the continuum of leadership style was done to meet the statistical

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<sup>1</sup>According to Fiedler, little is known about individuals whose LPC falls in the middle range; it is possible there is more than one meaning for high or middle LPC's; Fiedler, Leadership Effectiveness, p. 274.

<sup>2</sup>Ibid., p. 44.

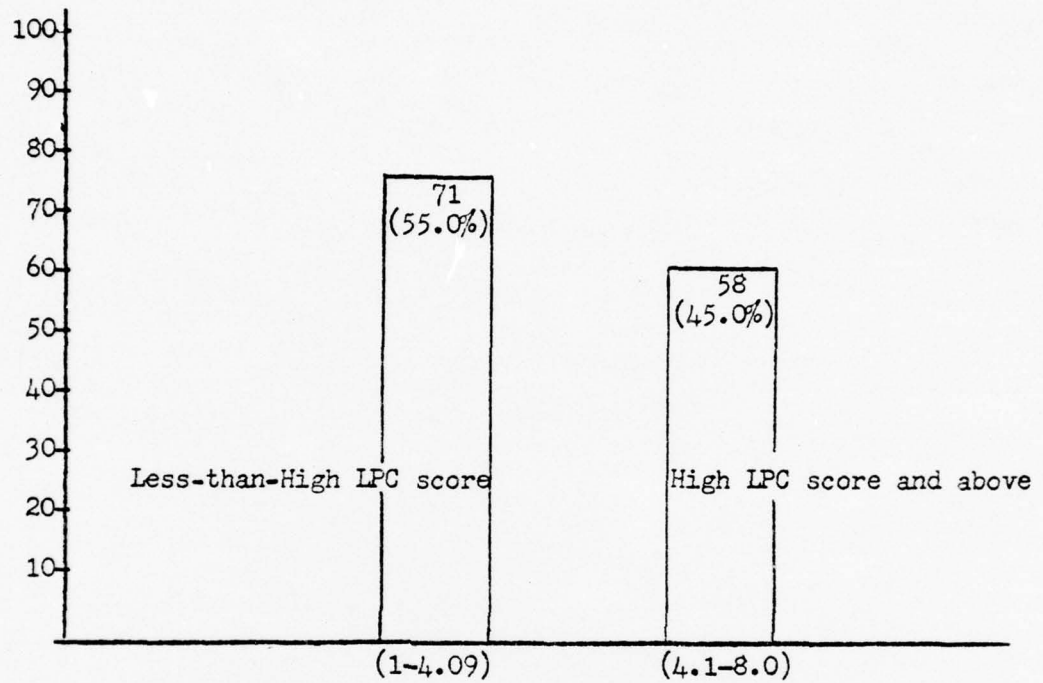


Figure 12. Histogram of Distribution of LPC Scores (Two Intervals)

requirements for a chi-square test associated with Hypothesis Fifteen.

The following section presents an examination of the sixth research question using the data distribution illustrated in Figure 12 as the basis for a frequency table employed in testing Hypothesis Fifteen.

#### Analysis of Research Question Six

As indicated earlier, the sixth research question asked: Is perceived flexibility (as determined by the Hill methodology) related to Least-Preferred-Coworker (LPC) scores (as determined by Fiedler's instrument)? The response to this question involved testing of Hypothesis Fifteen utilizing data as arranged in Table 29.

#### Test of Hypothesis Fifteen

An answer to the sixth research question required a measure of the extent of association between two characteristics (LPC scores and Style Flexibility). The measurement was made using the contingency coefficient C, a nonparametric measure of the extent of association, or relation, between two sets of attributes.<sup>1</sup> The observed frequencies of occurrence of scores within LPC score intervals, for each of the style-flexibility groups, were arranged in a frequency table (Table 29) for computation of a chi-square value. The value of the contingency coefficient C was computed by inserting the value of chi-square in

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<sup>1</sup>Siegel, Nonparametric Statistics, pp. 196-202.



TABLE 29

FREQUENCY TABLE

LEADERSHIP STYLE - STYLE FLEXIBILITY (TWO INTERVALS)

(Less-than-high-LPC score interval and  
high-LPC score and above interval)

SF-Group	Style Intervals (LPC)			
	(1-4.09)		(4.1-8.0)	
	No.	%	No.	%
SF-0	13	(10.0)	15	(11.6)
SF-1	14	(10.8)	12	(9.3)
SF-2	17	(13.2)	12	(9.3)
SF-3 & 4	27	(21.0)	19	(14.7)
Totals	71	(55.0)	58	(45.0)
			129	(100.0)
			177	

NOTE: Percentages based on total number of responses.

the formula:

$$C = \sqrt{\frac{X^2}{N + X^2}} \quad \text{where } N = \text{number of observations}$$

The following hypothesis was tested to determine the significance of the association indicated by the value of C. Regarding the relationship between Least-Preferred-Coworker scores and leadership style flexibility, the observed value of the contingency coefficient:

$H_0$ : Regarding the relationship between Least-Preferred-Coworker scores and leadership style flexibility the observed value of the contingency coefficient could have arisen by chance in a random sample from a population in which Least-Preferred-Coworker scores and leadership style flexibility were not correlated.

$H_a$ : Regarding the relationship between Least-Preferred-Coworker scores and leadership style flexibility the observed value of the contingency coefficient could not have arisen by chance in a random sample from a population in which Least-Preferred-Coworker scores and leadership style were not correlated.

The test of this hypothesis is summarized in Table 30; the chi-square test is described in Appendix N.<sup>1</sup> From the evidence the null hypothesis is accepted at the chosen level of significance, i.e., the observed value of the contingency coefficient could have arisen by chance.

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<sup>1</sup>Computation of the Contingency Coefficient C is described by Siegel in Nonparametric Statistics, pp. 196-202.

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NAVAL SUBMARINE MEDICAL RESEARCH LAB GROTON CONN

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LEADERSHIP-STYLE FLEXIBILITY, (U)

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TABLE 30

## TEST OF HYPOTHESIS FIFTEEN

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Null: The observed value of the contingency coefficient could have arisen by chance.

Alternative: The observed value of the contingency coefficient could not have arisen by chance.

Significance Level: 0.05, 3 d.f.

Statistical Test:  $\chi^2$

Decision Rule  
Reject  $H_0$  if:  $\chi^2_{0.05} (3) > 7.82$

Test Data (from Table 29):

13	15
14	12
17	12
27	19

Calculated Value:  $\chi^2 (3) = 1.239$

Value of C =  $\sqrt{\frac{\chi^2}{N + \chi^2}} = \sqrt{\frac{1.239}{129 + 1.239}} = 0.097$

Decision: Accept the null hypothesis at the chosen level of significance.

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### Summary

Almost one-half of the LPC scores (more than 48 per cent) were observed in an interval between the low-LPC and high-LPC intervals; in this interval the population of LPC scores increased as style flexibility increased from SF-0 to SF-4. A lesser number of LPC scores (38 per cent) was observed in the high-LPC interval and a few (3.9 per cent) were observed in the low-LPC interval. Only in the middle interval did the proportion of LPC scores increase as style flexibility increased from SF-0 to SF-3 & 4. There was no discernible pattern of variation in the other intervals. The measure of the extent of association between LPC scores and style flexibility indicated a very small contingency coefficient (0.097) which could have arisen by chance (as indicated by a chi-square test for significance). The evidence observed in this study indicated that perceived style flexibility was not related to LPC scores.

### Summary and Results

This chapter has presented the analysis of data gathered for the purpose of seeking answers to the last three research questions. The results of the analysis are presented below.

Research Question Four, which dealt with whether perceived flexibility was related to subordinates' evaluations by superiors, was examined by test of Hypothesis Twelve and Thirteen. The following results were observed:

1. Test of Hypothesis Twelve indicated that style flexibility was not related to performance evaluations. This was consistent with Hill's finding that no one degree of style flexibility appeared to be

related to higher performance ratings.

2. Test of Hypothesis Thirteen indicated that performance ratings obtained by use of the two instruments of the performance evaluation questionnaire were related in the population of scores.

3. Evaluation scores appeared to be inflated. The majority of scores (both instruments) were in rating intervals associated with terms such as good, superior, outstanding and exceptional; a pattern followed consistently within each SF group.

4. Hill's instrument produced a greater proportion of high and middle scores than the abridged Air Force instrument; however, no statistically significant difference was found between scores obtained by both instruments.

Research Question Five, which dealt with whether perceived flexibility was related to subordinates' satisfaction with superiors, was examined by test of Hypothesis Fourteen. The following results were observed:

5. Test of Hypothesis Fourteen indicated that the proportion of supervisors observed to be in each of the satisfaction intervals was not the same in all style-flexibility groups. This was consistent with Hill's finding that perceived flexibility was related to subordinates' satisfaction with superiors.

6. The majority of respondents appeared to be satisfied with their superiors. The majority of scores (76.3 per cent) were in high and middle rating intervals which indicated a great deal of satisfaction with superiors; this pattern was duplicated in all SF groups except SF-O. Approximately one-half (46 per cent) of the respondents who

perceived their superiors as being in SF-0 (least flexible) indicated low levels of satisfaction with their superiors.

7. While Hill also found that the proportion of supervisors observed to be in each of the satisfaction intervals was not the same in all SF groups; he observed that subordinates expressed more satisfaction with their superiors when they perceived them to be in SF-4 (most flexible).

Research Question Six, which dealt with whether perceived flexibility was related to Least-Preferred-Coworker scores, was examined by test of Hypothesis Fifteen. The following results were observed:

8. Test of Hypothesis Fifteen indicated that the observed value of the contingency coefficient used to measure the association between LPC scores and leadership style flexibility could have arisen by chance; i.e., no relationship between perceived flexibility (as determined by the Hill methodology) and Least-Preferred-Coworker (LPC) scores (as determined by the Fiedler instrument) was observed.

9. More than one-third (38.0 per cent) of the respondents had high-LPC scores (considered to be indicative of a relationship-oriented person).

10. Approximately four per cent (3.9 per cent) of the respondents had low-LPC scores (considered to be indicative of a task-oriented person).

11. Approximately one-half (48.4 per cent) of the respondents were in the region between high-LPC and low-LPC scores. The proportions



of these respondents in each SF group increased as perceived style flexibility increased. No pattern was identified in the other intervals or combination of intervals.

The above is a summary of the results obtained by virtue of analysis of the data. The next chapter presents a summary of the overall study, specific and general conclusions and their implications based on the results of this research, and recommendations for further research.



## CHAPTER VI

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

This final chapter begins with a summary of the study. Conclusions regarding leadership style flexibility are stated and are followed by conclusions concerned with leadership performance, satisfaction with leadership, and leadership style, each as related to leadership style flexibility. Lastly, recommendations are made for further research designed to provide additional tests of the methodology, to develop a performance instrument geared to verifiable objectives, to relate the style of leadership employed to style flexibility, to examine the satisfaction-style flexibility relationship, and to examine LPC scores in the middle interval in order to identify their relationship to leadership style flexibility.

#### Summary

The stated purpose of this study was: To apply the Hill methodology to a managerial situation in the United States to determine the degrees of leadership style variation perceived by subordinates and to determine how such variations were related to the nature of leadership problems, to superiors' performance evaluation of subordinates, and to subordinates' satisfaction with superiors. Additionally, the study was concerned with examining the relationship between

Fiedler's Least-Preferred-Coworker scores and the degrees of leadership flexibility identified by the Hill methodology.

Attainment of the study's objective involved seeking answers to five research questions concerned with whether: 1) Subordinates perceived leaders altering style to meet different situations, 2) leaders varied leadership style with the nature of the problem, 3) perceived style flexibility was related to performance evaluations of subordinates by superiors, 4) perceived flexibility was related to subordinates' satisfaction with superiors, and 5) perceived leadership style flexibility was related to Least-Preferred-Coworker (LPC) scores.

The replicative thrust of this study dictated use of the methodology employed by Hill, while the aspect concerning the relationship between leadership style flexibility and Least-Preferred-Coworker required the use of an instrument developed by Fiedler. Implementation of the methodology took the form of administering to a group of managers a questionnaire that would provide: 1) Their perceptions of the leadership styles used by their superiors, 2) their satisfaction with leadership received, 3) their opinion of their Least-Preferred-Coworker, and 4) their performance evaluations of subordinate managers.

There were two sources of data for this investigation: 1) Results of the research conducted by Walter Hill, and 2) a field study conducted by the writer. The field study was based on a group of 149 managers in the Naval Training Equipment Center located in Orlando, Florida. This organization met the criteria of numbers of personnel, of including at least three scalar levels of management, and of having a research and development mission. These criteria were required to

be met in order to replicate the Hill study methodology.

As a consequence of an initial meeting with representatives of the Naval Training Equipment Center, a management analyst was designated as survey coordinator, and documents which provided valuable personnel and organizational information were acquired by the writer. The survey coordinator was authorized to work out the details of procedure and date for administration of the questionnaire. Questionnaires were mailed to all 149 managerial personnel. The response rate on this mailing was 86 per cent. After the questionnaires were returned, a final meeting was held with Naval Training Equipment Center officials to complete data gathering.

Analysis of the questionnaire data resulted in conclusions in four areas: 1) Conclusions concerning style flexibility and variations of leadership style with the nature of the problem, 2) conclusions concerning the relationship between style flexibility and performance evaluations, 3) conclusions concerning the relationship between style flexibility and satisfaction, and 4) conclusions concerning the relationship between style flexibility and Least-Preferred-Coworker scores.

#### Conclusions and Implications

The primary source of data for this study was the perceptions of managers who responded to the questionnaire. These data are subject to bias due to non-response. The reasons for the non-response do not seem related to the information sought.<sup>1</sup> Additionally, by employing a large sample and because of the high rate of return, the effects of bias are small enough to be considered insignificant.

<sup>1</sup>The reasons were discussed earlier in Chapter Four.



The conclusions presented below are based on the analysis of data gathered during this study and on the data available in the Hill study, subject to the data limitations of bias, and subject to the limitations that they are based on the results of a single field study.

#### Leadership Style Flexibility

The current study, which employed the methodology used by Hill, supports the following conclusions and confirms the results reported by Hill.

##### Conclusion One

A considerable degree of style flexibility was perceived by subordinate managers to be exercised by superiors at both managerial levels.

A majority of respondents indicated that superiors would use some degree of style flexibility across four typical, but hypothetical, situations. Hill interpreted similar evidence from his study to support the existence of considerable leadership style flexibility among the managers he observed. However, it is noted that Fiedler defined the particular acts in which a leader engages in the course of directing and coordinating the work of his group members as leadership behavior, not leadership style. He defined the latter term as the underlying need-structure of the individual which motivates his behavior in various leadership situations. It appears that what Hill, and this writer, observed and referred to as leadership style flexibility would be



termed leadership behavior flexibility by Fiedler;<sup>1</sup> a distinction that has more than semantic implications.

If, as Fiedler asserts, leadership style, as measured through use of the Least-Preferred-Coworker instrument, is not the same as leader behavior and, if it is ". . . easier to change almost anything in a job situation than a man's personality and his leadership style",<sup>2</sup> then a few weeks of training in which a leader is told how to behave or convinced that a certain behavior is best will not result in appropriate behavior changes.<sup>3</sup> Fiedler feels that people have to be taught that they can change the situation so that it will better match their personality, i.e., that managers have to be trained in how to change situations rather than in how to change their personalities.<sup>4</sup>

On the other hand, if, as Tannenbaum and Schmidt assert, the successful leader is one who is keenly aware of those forces which are most relevant to his behavior at any given time,<sup>5</sup> and, if, as Vroom asserts, behavioral changes require "a process of self discovery and insight by each individual manager,"<sup>6</sup> then training in which a leader

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<sup>1</sup>The term leadership style flexibility, as employed earlier in the study, remains unchanged.

<sup>2</sup>Fiedler, "Engineering the Job to Fit the Manager," p. 115.

<sup>3</sup>Fred E. Fiedler, "The Leadership Game: Matching the Man to the Situation," Organizational Dynamics, Vol. 4 (Winter, 1976), p. 15.

<sup>4</sup>Ibid., p. 15.

<sup>5</sup>Tannenbaum and Schmidt, "How to Choose a Leadership Pattern," p. 101.

<sup>6</sup>Victor H. Vroom, "Can Leaders Learn to Lead," Organizational Dynamics, Vol. 4 (Winter, 1976), p. 21.

is told how to behave or is convinced that a certain behavior is best will result in appropriate behavior change. Vroom, in fact, designed a training program in which a leader can learn how to recognize the requirements of a situation and how to tailor his style to meet these requirements.<sup>1</sup> The following conclusion appears to support the view that leaders tailor style to meet the requirements of situations.

#### Conclusion Two

Subordinates perceived superiors altering leadership style with the nature of the problem; but they did not perceive superiors confining themselves to a limited style-response inventory which they would vary with the type of problem.

A majority of respondents did not perceive that their superiors, at either managerial level, treated problems as dichotomous pairs, i.e., used one style for simple problems and another style for complex problems, or that they used one style for interpersonal and another style for technical problems. From this the writer infers that subordinates did not feel that superiors had a "programmed response" to problems.

Many superiors were perceived to categorize problems in terms of like problem attributes, i.e., to use the same style for certain types of problems, and although not rigidly, or consistently, to adhere to a different style for other types of problems. Subordinate managers perceived that their supervisors varied leadership style most frequently on the basis of the use of a single style for problems with technical attributes followed (in order) by varying their style on the

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<sup>1</sup>Ibid., p. 21.

basis of whether the problem was simple, interpersonal, or complex. It was noted that as leadership style flexibility increased from SF-1 to SF-3, the proportions of managers perceived to use the same style for technical problems increased and the proportion for complex problems decreased, with no discernible pattern for simple and interpersonal problems. The tendency to use the same style for problems with like attributes might be explained by observing that certain types of problems have more appeal to managers than others; or that the experience managers have had with certain types of problems helps them develop a high level of confidence and hence they feel little anxiety when these problems occur and so they are comfortable with a single style. This explanation seems to be strengthened by the observation that the tendency to use the same style for technical problems was greater among middle managers (more experienced) than for first-line managers. The increased emphasis on use of the same style for technical problems as style flexibility increased might be explained by reasoning that these managers have developed a sufficiently high level of confidence in dealing with technical problems (i.e., problems within their technical disciplines) that it permits them to use the same style routinely and vary their style when other types of problems are presented.

About one-sixth of all responses to the Leadership Flexibility Questionnaire indicated that superiors were not perceived to categorize problems in terms of like problem attributes; i.e., the responses did not fit into any of the four categories of like problem attributes: Technical, interpersonal, simple, or complex. The heterogeneous content of the responses (superiors were not perceived to categorize



problems in terms of like attributes) indicated that no dominant attribute was perceived by the respondent. Such responses might have been accurate perceptions of superiors by their subordinates, i.e., that some managers did not use the same style for problems. It may also be that this subset of responses are indicative of an intervening variable that accounted for internal and directly unobservable processes, that, in turn, accounted for the responses given.

#### Hill's Results

The current study confirmed the following results reported by Hill. First, the majority of respondents felt that their superiors would vary their style according to the situation. Second, subordinates did not perceive their superiors to possess a limited style-response repertoire which varied with the type of problem. Third, subordinates saw their supervisors as tending to adopt a fairly consistent leadership style toward a certain set of problems. Fourth, the organization level at which respondents were located did not affect the responses given.

#### Leadership Performance and Style Flexibility

The current study supports the following conclusion and confirms Hill's conclusion that perceived leadership style flexibility is not directly related to managerial performance as measured by his research instrument.

#### Conclusion Three

Perceived leadership style flexibility was not found to be related to performance evaluations of subordinates by superiors.



Scores obtained by use of the two subjective performance evaluation instruments could have been used interchangeably without affecting the nature of this conclusion. While the instrument designed by Hill produced a greater proportion of high and middle scores than the abridged Air Force instrument, no statistically significant difference was found between the two sets of scores. Performance evaluation scores were inflated in all SF groups, a situation which might well mask a relationship between leadership style flexibility and leader performance evaluations, if it did exist.<sup>1</sup> The high ratings may represent part of a general trend toward inflated ratings as evidenced by high rating levels in the Armed Forces (previously cited in Chapter Five) and by the high level of grades in educational institutions. Perhaps managers are accustomed to giving high performance ratings as a means to meet the norms associated with competitiveness and the need to achieve in modern organizations; supervisory judgment often will be a major determinant in salary adjustment, but longer-term decisions (such as promotion) involve compilation of evidence like that contained in performance evaluations. The results cast doubt upon the validity of the use of subjective performance evaluation instruments as a measure of leadership effectiveness; and lends credence to Fiedler's contention that leader effectiveness could be measured in terms of group performance on the group's assigned primary task, even though the group's output is not entirely the function of the leader's skills.

Perhaps leadership flexibility is important only to meet situational demands; i.e., superiors evaluating subordinates deemed this

<sup>1</sup>More than two-thirds of the scores were in the higher rating intervals.

quality as important only where situations which confronted subordinate managers required style flexibility. (This study did not permit assessment of demands stemming from situations.) However, the extent to which a leader may be faced with demands for flexibility, either as a result of situational forces or in response to difference of behaviors of his followers, is not predictable.<sup>1</sup> It appears that the leader needs to be flexible to maintain a balance of his behaviors in order to attain a balance of outputs that meets his objectives and to engage in both task-oriented and relationship-oriented behavior rather than avoiding one or the other. It seems reasonable to view the effective leader as viewed by Vroom, i.e., one who acts ". . . in response to the demands of a situation as he perceives them. Above all, he is a flexible leader who has thought through his values and who has a repertoire of skills necessary to execute effectively each of the decision processes."<sup>2</sup>

#### Leadership Satisfaction and Style Flexibility

The current study supports the following conclusion and confirms Hill's observations that the proportion of respondents in each of the satisfaction intervals differed from SF group to SF group; but it does not confirm that subordinates expressed more satisfaction with their superiors when they perceived them to have the highest degree of style flexibility.

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<sup>1</sup>T. O. Jacobs, Leadership and Exchange in Formal Organizations (Alexandria, Va.: Human Resources Research Organization, 1971), p. 94.

<sup>2</sup>Vroom, "Can Leaders Learn to Lead?," p. 20.

Conclusion Four

Subordinate managers did not indicate the same level of satisfaction with superiors in all style flexibility groups.

The majority of respondents had satisfaction scores in the high and middle rating intervals; this indicated widespread satisfaction with superiors. This pattern was duplicated in all SF groups except SF-0 where approximately one-half of the respondents indicated low levels of satisfaction with their superiors. This observation was not congruent with Hill's finding that subordinates were more satisfied with superiors who possessed high style flexibility. The two observations may be consistent in that low satisfaction (not dissatisfaction in the sense employed by Herzberg) with superiors who possessed low flexibility and high satisfaction with superiors who possessed high flexibility may describe similar situations.

The high level of satisfaction expressed by many respondents might represent the final event in a sequence of motivated behavior in which the individual uses available information to decide upon what to do to achieve goals that he expects will lead to desired satisfaction.<sup>1</sup> Each score would then represent the result of a comparison between the individual's current and desired state of satisfaction at the time the questionnaire was completed. The high level of satisfaction among managers in the organization might be related to the view that groups ". . . are mechanisms for achieving individual satisfactions and, conversely, persons interact with other persons for the achievement of

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<sup>1</sup>Edward L. Deci, "The Hidden Cost of Rewards," Organizational Dynamics, Vol. 4 (Winter, 1976), p. 62.



satisfactions."<sup>1</sup> The widespread satisfaction observed would then appear to indicate that the organization served as the mechanism described. A combination of these two thoughts appears to be closer to a reasonable explanation than does either separately.

#### Leadership Style and Style Flexibility

Regarding leadership style and style flexibility, this study supports the following conclusion.

#### Conclusion Five

Perceived flexibility was not related to leadership style as measured by the Least-Preferred-Coworker instrument.

Very few respondents were identified as low-LPC leaders, while more than one-third of the respondents were identified as high-LPC leaders. Fiedler's original interpretation of low-LPC scores was that they identified individuals who were primarily motivated toward successful task achievement (manifested in terms of high levels of task-related or structuring activities), while high-LPC scores identified individuals who were primarily motivated by good interpersonal relations (manifested in high levels of consideration for socio-emotional behavior).<sup>2</sup> This interpretation does not account for the largest proportion of respondents in the current study, those with scores in the interval between

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<sup>1</sup>Cecil A. Gibb, "An Interaction View of the Emergence of Leadership," Australian Journal of Psychology 10 (June, 1958), p. 109.

<sup>2</sup>Martin M. Chemers and Robert W. Rice, "A Theoretical and Empirical Examination of Fiedler's Contingency Model of Leadership Effectiveness," Contingency Approaches to Leadership, ed. by James G. Hunt and Lars L. Larson, (Carbondale, Ill.: Southern Illinois University Press, 1974), p. 115.



high and low-LPC.

A more recent interpretation of LPC scores by Fiedler was that secondary goals ". . . become active when primary motives have been satisfied."<sup>1</sup> Accordingly, the secondary goal ". . . for low-LPC persons is to maintain successful interpersonal relations, while high-LPC persons are to attain individual prominence and attention within the group."<sup>2</sup> This explanation appears to assume that behavior of both high-LPC and low-LPC persons changes with the situation; and, it serves as a basis for explaining the large proportion of respondents in the interval between high and low-LPC. This interval was unique in that it was the only interval in which the proportion of LPC scores increased as style flexibility increased. A possible explanation for existence of this large group might be, as indicated by Fiedler's interpretation cited above, that individuals were not solely task or relationship-oriented but rather chose the approach appropriate to the demands of the situation; and, that flexibility in choice of approach was confirmed by the large proportion of respondents in high style flexibility groups. This explanation is not inconsistent with Fiedler's observation that he ". . . would not want to preclude . . . the possibility (that) . . . the leader could change his motivational structure or his behavior to suit the situation."<sup>3</sup> This explanation also is not inconsistent with the view set forth by Argyris; i.e., the respondents in this interval may represent people in transition from Model I (Theory X)

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<sup>1</sup>Ibid., p. 116.

<sup>2</sup>Ibid., p. 116.

<sup>3</sup>Fiedler, "The Leadership Game," p. 13.

toward Model II (Theory Y), with each level of increased style flexibility representing another step toward ". . . creating a Model II behavioral world with their own subordinates."<sup>1</sup>

It appears that it is possible for both kinds of role behavior to be combined in the person of a single leader, a statement supported by the first conclusion which indicated that a considerable degree of style flexibility was perceived at both managerial levels by subordinate managers.

#### Recommendations for Further Research

Further research is needed to provide additional tests of the methodology (Hill's) used in this study and to improve upon it. Further tests should be directed toward other types and sizes of organizations. Such testing under a variety of conditions would provide a basis for generalizations about the methodology.

Research on increasingly sophisticated empirical approaches should focus on improving existing measures and developing new measures. This is a large area with many paths for exploration. Some specific directions are suggested below.

#### Leadership Evaluation

Further research is needed to develop a leadership performance evaluation instrument that reflects the functional dependency between leadership and group performance. Results obtained with instruments employed in this study indicate the need for more precision and greater refinement of data in order to identify a relationship between leader

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<sup>1</sup>Chris Argyris, "Leadership, Learning, and Changing the Status Quo," Organizational Dynamics 4 (Winter, 1976), p. 43.

performance and perceived style flexibility (if such a relationship did exist). The results of this study suggest the need for development of a new leadership performance evaluation instrument specifically, an instrument that relates performance to assigned verifiable job objectives. It appears that this would make the measurement of the contribution of individuals to goal accomplishment more precise, thus facilitating identification of any relationship with style flexibility.

#### Leadership Style and Style Flexibility

Further development of Hill's leadership style flexibility instrument is needed to establish better the relationship of specific styles of leadership employed to style flexibility. A specific possibility is to replace the four styles specified by Hill with the five styles specified in the Vroom-Yetton model.<sup>1</sup> An additional possibility is to increase the number of managerial problems presented to the respondent from four to six by stating one additional problem characterized as being between simple and complex and another problem characterized as being between task and interpersonal. It appears that this would tend to improve definition of a gradient of style flexibility by increasing the number of style flexibility intervals, and at the same time relate style flexibility data with the Vroom-Yetton model of leadership training.

#### Satisfaction and Style Flexibility

The finding, in this study, of an association between satisfaction with leaders and leadership style flexibility suggests the need for a more sophisticated examination of the relationship to determine

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<sup>1</sup>Vroom, "Can Leaders Learn to Lead?," p. 18.



whether the source of satisfaction with a superior stems solely from satisfaction of personal needs, or stems from satisfaction of both personal and organizational needs. It would appear that availability of such information would contribute to a more meaningful interpretation of the relationship (if any), between both satisfaction and leadership style flexibility, and between satisfaction and leadership performance.

#### Least-Preferred-Coworker Scores and Style Flexibility

A major factor in the Contingency Theory is identification of low-LPC (task-oriented) and high-LPC (relationship-oriented) leaders by virtue of scores obtained using a simple instrument. The identification in this study of a large group of respondents that did not fit into either category, coupled with Fiedler's feeling that little is known about individuals whose LPC falls into the middle range, suggests the need for further research in this area. The confirmation of the existence of a range of styles between the task and interpersonal region and the description of specific styles in that region, would be a step toward development of the capability of measuring the leadership style of individuals with more precision. This, in turn, would contribute to development of a uniform approach to leadership training in that it would serve to identify entry levels for individuals and to measure progress toward attainment of a desired leadership style.

The suggestions for future research presented above indicate that the possibilities are far from exhausted. It appears that leadership presents a vital and challenging field for research.



# APPENDIX A

## LEADERSHIP QUESTIONNAIRE

You are one of a group of experienced managers asked to express your ideas regarding supervisory behavior. On the following pages there are groups of questions designed to help you express your opinion quickly and easily.

Please read the instructions for each group. Some items may appear to be similar but they express differences that are important in the description of leadership. Each item should be considered as a separate description.

Before you turn the page, please provide the following general information which will be used to make the results more meaningful.

1. Which of the words listed on the left side of this page best describes the type of work performed by the people you manage? (CIRCLE AS MANY AS NECESSARY.)

Accountant	Illustrator	Purchasing agent
Administrator	Inventory manager	Procurement analyst
Auditor	Management analyst	Psychologist
Budget Analyst	Physiologist	Requirement analyst
Configuration-controller	Physicist	Specification writer
Contract negotiator	Planner	Statistician
Draftsman/designer	Programmer	Systems analyst
Education specialist	Project director	Technician
Engineer	Program manager	Tradesman
	Production head	

2. Which of the following best describes your educational level?

a. Grade School	d. Some College	g. Doctoral Degree
b. Some High School	e. Graduated College	h. Vocational/Technical
c. Graduated High School	f. Have Advanced Degree	Graduate

3. Which of the following describes your age group?

a. 24 and younger	c. 35 to 49	e. 65 and older
b. 25 to 34	d. 50 to 64	

4. Which describes your work group?

a. Primary task requires close coordination of several group members.
b. Members do job relatively independent of other group members.

Do not write in this space

QUESTIONS?

Call: 646-5304

## LEADERSHIP FLEXIBILITY

Instructions:

The supervisor's responsibility is to see that problems which arise in his department are solved. There are at least four distinct styles, described below, which a supervisor may use in dealing with these problems.

This questionnaire tries to identify the style your supervisor uses to solve problems which arise in your department. Please indicate which style you feel your supervisor would use, not what style he should use to solve the general types of problems given on the opposite page.

Description of Styles:

**STYLE A** A directive approach, e.g., "I'll take charge of this situation and set it right." A supervisor who uses this style places his major emphasis on getting the job done and concentrates on giving his subordinates orientation, information, and suggestions as well as his opinions, evaluations, analyses, and directions. This supervisor is not too concerned with the feelings and attitudes of his subordinates because he believes that these matters are not part of his job. He expects his subordinates to accept and do what he says.

**STYLE B** Also a directive approach, but the supervisor who uses this approach recognizes the need to maintain good human relations although this is clearly secondary to getting the job done. He tries to develop positive feelings with subordinates because he knows that good human relations are helpful in encouraging subordinates to effectively implement what he has decided.

**STYLE C** A nondirect approach. It is participatory. The supervisor uses this approach recognizes that although his primary concern should be the maintenance and development of positive feelings and attitudes among his subordinates, he must also emphasize getting the job done. After asking his subordinates for orientation, information, and suggestions, as well as their opinions, suggestions, analyses, and directions, he then takes charge and sees that a solution is developed and put into action by his subordinates.

**STYLE D** Also a nondirective, participatory approach. The supervisor who uses this style places major emphasis on maintaining and building good human relations and pays a lot of attention to the feelings and attitudes of his subordinates by concentrating on asking them for their opinions, evaluations, analyses, and directions. This supervisor believes that if he succeeds in developing good human relations and gets his subordinates involved in the problem, they will solve the problems themselves and he will not have to make sure that good solutions are developed and put into action.

QUESTIONNAIRE (Leadership Flexibility)	
PROBLEM	My supervisor would use this style. (Circle one)
1. A <u>human relations problem</u> (e.g., planning and implementing a 25% staff reduction) where there are many ways to approach the problem, many potentially conflicting criteria to be met, and no immediate way to prove that the decision taken was the right one.	A      B      C      D
2. A <u>technical problem</u> (e.g., will a new computer improve the technical efficiency of scientific laboratory, and if so, which one?) where there are many ways to approach the problem, many potentially conflicting criteria to be met, and no immediate way to prove that the decision taken was the right one.	A      B      C      D
3. A <u>human relations problem</u> (e.g., two employees have a serious personal disagreement) where the cause of the problem is reasonably certain, there are only one or two ways to correct the problem, and it will be easy to prove if the decision taken was the right one.	A      B      C      D
4. A <u>technical problem</u> (e.g., a sudden decline in product quality) where the cause of the problem is reasonably certain, there are only one or two ways to correct the problem, and it will be easy to prove if the decision taken was the right one.	A      B      C      D



## PERFORMANCE EVALUATION QUESTIONNAIRE

## PART ONE

## Instructions:

1. Consider the assignment of the individual.
2. Rank the criteria in order of importance of his assignment. Do this as follows: under the heading "Rank" place the figure (1) next to the most important criteria, the figure (2) for the next most important, etc.
3. Evaluate how well the individual performs with respect to each criteria by placing an (X) in the box you feel to be appropriate.

		RATING					
		Unsatisfactory	Fair	Average	Good	Superior	Outstanding
		Below average, shows little or no signs of improvement.	Below average, BUT shows signs of improving.	Average performance.	Usually above average, BUT not consistently so.	Consistently above average.	Consistently WELL above average.
CRITERIA	RANK						
Setup work objectives and priorities.							
Plans work assignments.							
Utilization of available resources.							
Carries out work assignments.							
Motivates and inspires others to work.							
Written and oral communication ability.							

## PART TWO

## Instructions:

Please complete the following for the same individual by placing an (X) in the appropriate box for each rating factor. Note that item six involves evaluation of both "write" and "speak".

## Rating Factors

<b>1. Job Capability</b>					
Has gaps in fundamental knowledge and skills of his job.	Has a satisfactory knowledge and skill routine jobs.	Has excellent knowledge and is well skilled on all parts of his job.	Has exceptional understanding and skill on all parts of his job.	Has far reaching grasp of job area. Authority in his field.	
<b>2. Planning Ability</b>					
Relies on others to bring problems to his attention.	Plans ahead just enough to get by in his present job.	Careful effective planner. Anticipates and acts to solve problems.	Capable of planning beyond requirements of present job.	Capable of top level planning. High calibre thinker and planner.	
<b>3. Executive Management</b>					
Poor organizer. Does not make effective use of resources.	Maintains ordinary efficiency of operation.	Carefully considers economy of operation. Wisely uses resources.	Maintains effective economy. Weighs costs against results.	Highly skilled in balancing cost against results.	
<b>4. Executive Judgment</b>					
Decisions and recommendations sometimes unsound or ineffective.	Judgment usually sound and reasonable, with occasional errors.	Displays good judgment, resulting from sound evaluation.	Exceptionally sound, logical thinker in job related situations.	Has knack for arriving at right decision even on complex matters.	
<b>5. Human Relations</b>					
Does not get along with people, this hinders effectiveness.	Has difficulty getting along with associates.	Gets along with people adequately. Average at maintaining relations.	Above average skills in human relations.	Outstanding skills in human relations.	
<b>6. Writing Ability and Oral Expression</b>					
Unable to express thoughts clearly.	Expresses thoughts satisfactorily.	Expresses thoughts clearly and concisely.	Consistently expresses ideas clearly.	Outstanding ability to communicate.	
Write Speak	Write Speak	Write Speak	Write Speak	Write Speak	
<b>7. Job Accomplishment</b>					
Quality or quantity of work does not meet job requirements.	Performance is barely adequate to meet job requirements.	Quality and quantity of work are very satisfactory.	Performance is above normal expectations to meet job requirements.	Quality and quantity of work are clearly superior.	



## LEADERSHIP SATISFACTION

- Instructions:**
1. If an item listed below describes the type of supervision you receive, put a (Y) between the brackets provided.
  2. If it does not describe the type of supervision you receive put an (N) between the brackets provided.
  3. If you cannot decide whether it does or does not apply to the type of supervision you receive, place a question mark (?) between the brackets.

## QUESTIONNAIRE (Job Descriptive Index)

1. Asks my advice . . . . . ( )
2. Hard to please . . . . . ( )
3. Impolite . . . . . ( )
4. Praises good work . . . . . ( )
5. Tactful . . . . . ( )
6. Influential . . . . . ( )
7. Up to date . . . . . ( )
8. Doesn't supervise enough . . . ( )
9. Quick tempered . . . . . ( )
10. Tells me where I stand . . . . ( )
11. Annoying . . . . . ( )
12. Stubborn . . . . . ( )
13. Knows job well . . . . . ( )
14. Bad . . . . . ( )
15. Intelligent . . . . . ( )
16. Leaves me on my own . . . . . ( )
17. Lazy . . . . . ( )
18. Around when needed . . . . . ( )

**STYLE OF LEADERSHIP**  
(Least-Preferred Coworker)

**Explanation:**

People differ in the ways they think about those with whom they work. This may be important in working with others.

Below are pairs of words which are opposite in meaning, such as "Very Neat" and "Not Neat". You are asked to describe someone with whom you have worked by placing an "X" in one of the spaces on the line between the two words.

Each space represents how well the adjective fits the person you are describing as if it were written:

Very Neat:	:	:	:	:	:	:	:	Not Neat
Very Neat 0		7		6		5		4
		Quite Neat		Somewhat Neat		Slightly Neat		Slightly Untidy
						3		2
						Somewhat Untidy		Quite Untidy
								1
								Very Untidy

For example: If you were to describe the person with whom you are able to work least well, and you ordinarily think of him as being quite neat, you would put an "X" in the second space from the words Very Neat, like this:

Very Neat:	:	X	:	:	:	:	:	Not Neat
Very Neat 0		7		6		5		4
		Quite Neat		Somewhat Neat		Slightly Neat		Slightly Untidy
						3		2
						Somewhat Untidy		Quite Untidy
								1
								Very Untidy

If you ordinarily think of the person with whom you can work least well as being only slightly neat, you would put your "X" above the 5.

If you would think of him as being very untidy, you would use the space nearest the words Not Neat.

**Instructions:**

Look at the words at both ends of the line before you put in your "X". Please remember that there are no right or wrong answers. Work rapidly; your first answer is likely to be the best. Please do not omit any items, and mark each item only once.

Instructions:

Think of the person with whom you can work least well. He may be someone you work with now, or he may be someone you knew in the past. He does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he appears to you by placing an "X" in one of the spaces on the line between the words on the opposite page. Look . . .

## QUESTIONNAIRE (Least Preferred Coworker)

Pleasant	: _ : _ : _ : _	: _ : _ : _ : _	: Unpleasant
Friendly	: _ : _ : _ : _	: _ : _ : _ : _	: Unfriendly
Rejecting	: _ : _ : _ : _	: _ : _ : _ : _	: Accepting
Helpful	: _ : _ : _ : _	: _ : _ : _ : _	: Frustrating
Unenthusiastic	: _ : _ : _ : _	: _ : _ : _ : _	: Enthusiastic
Tense	: _ : _ : _ : _	: _ : _ : _ : _	: Relaxed
Distant	: _ : _ : _ : _	: _ : _ : _ : _	: Close
Cold	: _ : _ : _ : _	: _ : _ : _ : _	: Warm
Cooperative	: _ : _ : _ : _	: _ : _ : _ : _	: Uncooperative
Supportive	: _ : _ : _ : _	: _ : _ : _ : _	: Hostile
Boring	: _ : _ : _ : _	: _ : _ : _ : _	: Interesting
Quarrelsome	: _ : _ : _ : _	: _ : _ : _ : _	: Harmonious
Self-Assured	: _ : _ : _ : _	: _ : _ : _ : _	: Hesitant
Efficient	: _ : _ : _ : _	: _ : _ : _ : _	: Inefficient
Gloomy	: _ : _ : _ : _	: _ : _ : _ : _	: Cheerful
Open	: _ : _ : _ : _	: _ : _ : _ : _	: Guarded

# APPENDIX B

## Summary of Data Reported by Hill

Supervisors	Number of Respondents	Number of Subordinates Perceiving Supervisors as Using One Leadership Style for:		Number of Subordinates Perceiving Supervisors as Using the Same Leadership Style for:				
		Complex and Different Style for Simple Problems	Interpersonal and Different Style for Technical Problems	Four Situations	Simple Problems	Complex Problems	Interpersonal Problems	Technical Problems
Company A, R & D								
Middle Managers	18	0	2	2	5	8	5	11
First-Line Managers	34	3	5	6	15	17	18	16
Total Managers	52	3	7	8	20	25	23	27
Company B, R & D								
Middle Managers	14	1	4	2	6	5	10	8
First-Line Managers	20	0	4	3	6	3	10	8
Total Managers	34	1	8	5	12	8	20	16
Company B, Acctg.								
Middle Managers	8	1	1	0	2	3	2	3
First-Line Managers	30	4	6	4	11	10	13	14
Total Managers	38	5	7	4	13	13	15	17
Totals								
Middle Managers	40	2	7	4	13	16	17	22
First-Line Managers	84	7	15	13	32	30	41	38
Total Managers	124	9	22	17	45	46	58	60



Summary of Data Reported by Hill  
(Continued)

Significance Tests of Average Effectiveness,  
Rating of Supervisors Using Varying  
Degrees of Leadership Style  
Flexibility

<u>Leadership</u> <u>Style Tested</u>	<u>Rating for</u> <u>Style Tested</u>	<u>Number of</u> <u>Supervisors</u>	<u>Rating for</u> <u>Other Styles</u>	<u>Number of</u> <u>Supervisors</u>	<u>"T"</u> <u>Value</u>
SF-0	59.4	16	59.4	101	0
SF-1	59.9	21	58.6	96	0.381
SF-2	60.1	33	58.4	84	0.669
SF-3	57.6	43	59.3	74	-0.592
SF-4	54.8	<u>4</u>	59.0	113	-1.210
Total		117			

Significance Tests of Subordinates Average  
Satisfaction with Supervisors Using  
Varying Degrees of Leadership  
Style Flexibility

<u>Leadership</u> <u>Style Tested</u>	<u>Satisfaction</u> <u>for</u> <u>Style Tested</u>	<u>Number of</u> <u>Supervisors</u>	<u>Satisfaction</u> <u>for</u> <u>Style Tested</u>	<u>Number of</u> <u>Supervisors</u>	<u>"T"</u> <u>Value</u>
SF-0	41.8	17	41.9	106	-0.018
SF-1	43.8	25	41.4	98	0.718
SF-2	41.7	34	41.98	89	-0.157
SF-3	40.6	43	42.6	80	-1.190
SF-4	46.3	<u>4</u>	41.75	119	2.420*
Total		123			

\*p 0.05 (two tailed)

SOURCE: Adapted from Tables 10 through 18 in Hill, "Leadership Style," pp. 70-78.

APPENDIX C

The Florida State University  
Tallahassee, Florida 32306

Office of the Provost  
Graduate Studies  
and Research

November 15, 1974

M E M O R A N D U M

TO: Interested Division II Members

FROM: Robert M. Johnson  
Provost, Graduate Studies and Research

SUBJECT: Planned Visit of Captain Scott in Relation  
to Navy Dissertation/Research

I believe in late October Provost Fordyce informed some of you of Captain Scott's visit of October 18 in which he discussed with us the Navy's interest in assisting graduate students in various areas of research which the Navy proposes to make available on an exchange basis. In light of this, Captain Scott is returning to Florida State University with several colleagues to meet with each division's academic deans, chairmen and interested faculty to fully explain what he is proposing and answer any questions at that time.

If you are interested in finding out more about this proposed program, there will be a meeting for Division II members on Monday, November 25 at 11 a.m. in room 229 Psychology Research Building. Please inform anyone else you think might be interested in this.

RMJ/rdw

APPENDIX D

Department of the Navy  
Chief of Naval Education and Training Support  
Pensacola, Florida 32509

Code N-214  
1500  
17 APR 1975

From: Chief of Naval Education and Training Support  
To: Commanding Officer, Naval Training Equipment Center  
Subj: Doctoral Candidate Research Program; request for assistance in  
Ref: (a) CNETS Memo Code N-21 of 16 July 1974 (NOTAL)  
Encl: (1) CNETS Field Task Assignment Document No. 50289-21-OR-48

1. Under the provisions of reference (a), the CNETS entered into an agreement with The Florida State University to make in-house resources available to qualified doctoral candidates who were involved in a research project which could provide the CNETS with useful data in developing training policy or improving training management.

2. The initial request for assistance has come from Mr. Andrew J. Schou who is performing research for the degree of Doctor of Business Administration, School of Business, The Florida State University. This research deals with management styles and effectiveness of middle and first-line managers. The CNETS has reviewed the draft prospectus of this research (which is subject to final approval by the appropriate FSU dissertation committee), and finds that it meets the requirements of reference (a). This research is relevant to the Navy training mission and purpose, and has the potential of providing for more effective management of training personnel.

3. The research involves administering four questionnaires to approximately 170 personnel, preferably with the same organization. These personnel should be about equally divided between those who perform R&D activities and those who provide administrative support (especially comptrollers, accountants, and so forth). In addition, about one-third should be middle managers and the remainder should be first-line managers. The four questionnaires would take approximately 15 minutes each to administer. In order to avoid the adverse effects of prolonged testing, only one or two of these questionnaires would be administered in single sessions over a period of several days. The tests can be administered to groups of any size.



Code N-214  
1500

4. Inasmuch as NAVTRAEQUIPCEN is the only command within the CNETS which has 170 personnel at these management levels, and is also conveniently located and accessible to Mr. Schou, it is requested that NAVTRAEQUIPCEN provide Mr. Schou with the opportunity to identify, and administer questionnaires to, these personnel. It is further requested that Mr. Schou be provided with a functional organization chart in order to make preliminary determinations as to who would be the most appropriate subject personnel. These determinations, as well as a prospective testing protocol, should then be formally submitted to NAVTRAEQUIPCEN by Mr. Schou for approval.

5. Mr. Schou has mentioned that the questionnaires could be ready for administration during the 15-30 May 1975 timeframe, subject to NAVTRAEQUIPCEN approval. In addition, although Mr. Schou has indicated that proctoring assistance will not be required, any provision which NAVTRAEQUIPCEN could make to provide such a service would probably be most appreciated. It is requested that Mr. Schou be authorized access to the Autovon system in order to contact the CNETS directly should unforeseen problems arise.

6. For control purposes, this project is assigned Field Task No. 50289-21-OR-48. The CNETS task monitor will be LCDR Robert J. Biersner (Code N-214). LCDR Biersner is considered to be particularly well qualified in this research area because he holds a Ph.D. degree in psychology and has published research on the subject of personnel selection and management.

R. L. SCOTT

Copy to w/o encl:  
CNET

Dr. Robert M. Johnson, Provost, Graduate Studies and Research, The  
Florida State University  
Dr. B. J. Hodge, 2306 Kilkenney West, Tallahassee, FL 32303  
Mr. Andrew J. Schou, 2300 Forrest Road, Winter Park, FL 32789



APPENDIX E

Department of the Navy  
Chief of Naval Education and Training Support  
Pensacola, Florida 32509

Code N-214  
1500  
29 APR 1975

From: Chief of Naval Education and Training Support  
To: Mr. Andrew J. Schou, 2300 Forrest Road, Winter Park,  
Florida 32789

Subj: Field Task Assignment No. 50289-21-OR-48; NAVTRA-  
EQUIPCEN acceptance of

Ref: (a) CNETS ltr Code N-214 1500 of 17 Apr 1975

Encl: (1) Copy of Field Task Assignment No. 50289-21-OR-  
48 as accepted by NAVTRA-EQUIPCEN Code N-32 on  
21 Apr 1975

1. The request for assistance in collecting data for your doctoral research which was made in reference (a) has been formally accepted by NAVTRA-EQUIPCEN as indicated in enclosure (1). You are authorized and encouraged to establish contact with NAVTRA-EQUIPCEN Code N-32 at the earliest opportunity in order to complete this task.

J. R. Palmquist  
Chief Staff Officer

Copy to: w/o encl  
CNET

Dr. Robert M. Johnson, Provost, Graduate Studies and Research, The  
Florida State University  
Dr. B. J. Hodge, 2306 Kilkeeney West, Tallahassee, FL 32303  
NAVTRA-EQUIPCEN

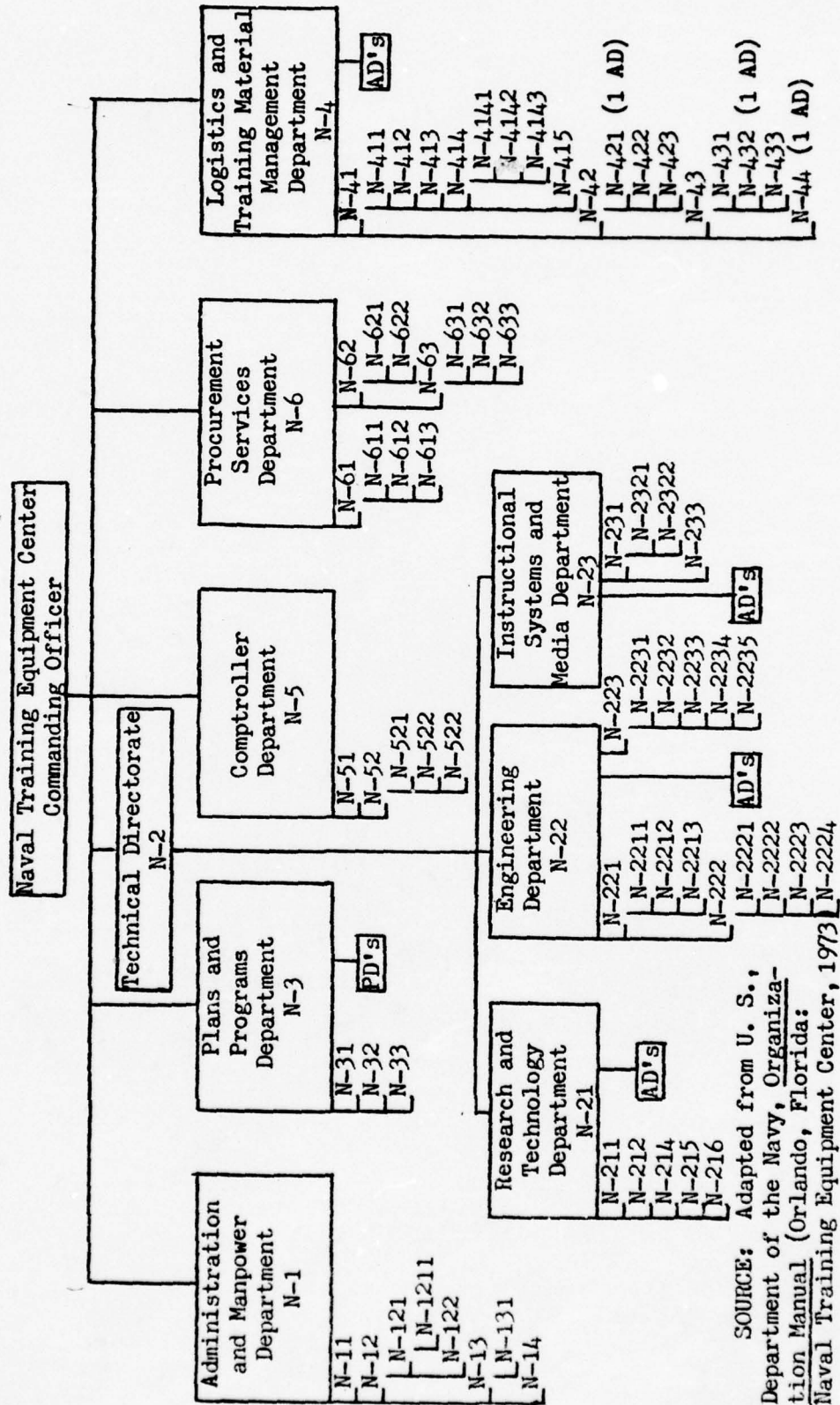
## CHIEF OF NAVAL TRAINING SUPPORT

FIELD TASK ASSIGNMENT

From	To	Via
CNETS, N-2	NAVTRAEQUIPCEN	
Field Task Assignment No.	Alternate Point of Contact	
50289-21-OR-48	LCDR R. J. Biersner, Code N-214 A/V 922-1392	
Subject		
Doctoral Candidate Research Program; request for assistance in Description		

Released By	Date	<input type="checkbox"/> Milestones Requested
CHARLES B. HAVENS	29 APR 1975	<input type="checkbox"/> Milestones Attached
By direction		
RETURN BLOCK		
To	Via	
CNETS		
<input checked="" type="checkbox"/> Task Accepted	Comments	
<input type="checkbox"/> Task Refused		
<input type="checkbox"/> Revision Required		
Signature	Date	
F. E. Wolf, Jr., Acting Head, Code N32	21 April 1975	
FIELD TASK ASSIGNMENT		
CNIS 1500/8 (6-73)		

## APPENDIX F



SOURCE: Adapted from U. S.,  
Department of the Navy, Organization Manual (Orlando, Florida:  
Naval Training Equipment Center, 1973)

NOTE: N-1, N-2, etc. designates each element, e.g., Technical Directorate mail is addressed to N-2.  
Figure 13. Functional Organization, Naval Training Equipment Center



## APPENDIX G

### Position Titles, Naval Training Equipment Center

<u>Department Code</u>	<u>Department Name</u>
N-1	Administration and Manpower Department
N-11	Management Analysis and Manpower Division
N-12	Administrative Services Division
N-121	Administration and Security Branch
N-1211	Mail Services Section
N-122	Support Services Branch
N-13	Technical Information Division
N-131	Technical Library Branch
N-14	Facilities Management Division
N-2	Technical Directorate
N-21	Research and Technology Department
N-211	Physical Sciences Laboratory
N-212	Electronics and Acoustics Laboratory
N-214	Computer Laboratory
N-215	Human Factors Laboratory
N-216	Laboratory Services Division
N-22	Engineering Department
N-221	Systems Engineering Division
N-2211	Analysis and Design Branch
N-2212	Engineering Support Branch
N-2213	Trainer Facilities Planning Branch
N-222	Air Warfare Systems Division
N-2221	Attack Trainers Branch
N-2222	Air Defense Trainers Branch
N-2223	Air ASW Trainers Branch
N-2224	Special Systems Branch
N-223	Sea/Land Warfare Systems Division
N-2231	Surface Systems Branch
N-2232	Surface Systems (ASW) Branch
N-2233	Subsurface Systems Branch
N-2234	Land Combat Systems Branch
N-2235	Armor/Missile Systems Branch
N-23	Instructional Systems and Media Department
N-231	Instructional Systems Development Department
N-2321	Audio-Visual Media Branch
N-2322	Audio-Visual Systems Branch
N-233	Support, Test and Evaluation Division
N-3	Plans and Programs Department
N-31	Plans and Operations Division
N-32	Program Planning Division
N-33	Project Direction Division



Department CodeDepartment Name

N-4	Logistic and Training Material Management Department
N-41	Modification and Maintenance Engineering Division
N-411	Maintenance Engineering Branch
N-412	Modification/Modernization Engineering Branch
N-413	Digital Program Support Branch
N-414	Modification, Rework and Test Branch
N-4141	Engineering Section
N-4142	Manufacturing Section
N-4143	Resource Analysis and Control Section
N-415	Configuration Management Branch
N-42	Support Documentation and Training Division
N-421	Technical Training Branch
N-422	Data Management Branch
N-423	Technical Manuals Branch
N-43	Field Engineering and Support Division
N-431	Aviation Trainers (ILS) Branch
N-432	Sea/Land (ILS) Branch
N-433	Logistic Management Systems Branch
N-44	Training Material Management Division
N-5	Comptroller Department
N-51	Budget and Program Analysis Division
N-52	Accounting and Control Division
N-521	General Accounting Branch
N-522	Financial Management Systems and Internal Control Branch
N-6	Procurement Services Department
N-61	Air and Research Procurement Division
N-611	Attack and Air Defense Trainers Branch
N-612	ASW and Special Systems Trainers Branch
N-613	Research, AF, NUSC, and NCSL Servicing Branch
N-62	Sea/Land Procurement Division
N-621	Surface and Subsurface Systems Branch
N-622	Land Combat, Armor, Missiles, Formal ADV Branch
N-63	Supply Management Division
N-631	Production Requirements Branch
N-632	Supply Support Branch
N-633	Warehousing Branch

SOURCE: U. S., Department of the Navy, Personnel Staffing  
(Orlando, Florida: Naval Training Equipment Center, 1975).

## APPENDIX H

### Agenda

Briefing, Commanding Officer and Staff of NTEC

Subject: Doctoral Candidate Research  
(Field Task No. 50289-21-OR-48)

1. Background: Agreement between Chief of Naval Education and Training Support (CNETS) and The Florida State University.
  - a. Makes U. S. Navy in-house resources available to qualified doctoral candidates.
  - b. Provides CNETS with useful data in developing training policies or improving training of managers.
2. Research Subject: Leadership Styles and Effectiveness.

(An examination of leadership style in an organizational environment.)
3. Procedure at NTEC:
  - a. Review functional-organization information
  - b. Identify middle and first-line managerial personnel
  - c. Design a testing procedure to:
    - \* Administer questionnaires.
    - \* Observe confidentiality of respondents (Avoid data bias from discussion of questionnaire by respondents).
  - d. Recommend time/date
  - e. Obtain NTEC concurrence in procedure
  - f. Administer questionnaires and collect responses

APPENDIX I

PLAN OF THE DAY  
Naval Training Equipment Center  
Orlando, Florida

OFFICIAL ORDERS:

WED, 23 JUL

\* \* \* \* \* EXTRACT \* \* \* \* \*

(T) 2. MIDDLE MANAGERS AND FIRST LINE SUPERVISORS. Middle Managers and First Line Supervisors are reminded of the requirement by the Commanding Officer to complete and immediately return to N-11 survey questionnaires that were delivered to them on Thursday, 17 July 1975.

\* \* \* \* \* EXTRACT \* \* \* \* \*

ROBERT B. WARD

APPENDIX J

Department of the Navy  
Naval Training Equipment Center  
Orlando, Florida 32813

N-11:JAH  
8 JUL 1975

From: Commanding Officer, Naval Training Equipment Center  
To: (Space left blank to permit letter to be addressed to individual managers.)

Subj: Doctoral Research Program

Ref: (a) CNETS ltr Code 214 1500 of 17 April 1975

Encl: (1) Questionnaire

1. By reference (a), the Chief of Naval Education and Training Support requested that this organization participate in the subject Doctoral Research Program by responding to the questionnaire which is attached as enclosure (1).
2. The questionnaire has been designed to guarantee that each respondent remains anonymous in all respects. The results will become part of on-going naval research in the area of leadership and management and will not be used in any way to affect your job situation.
3. Your cooperation in completing the questionnaire fully and objectively will be appreciated.

R. W. Green

NOTE: R. W. Green was the Commanding Officer of NTEC.



APPENDIX K

The Florida State University  
Tallahassee, Florida 32306

School of Business

July 28, 1975

Dear Sir:

Please accept my thanks and appreciation for your participation in the Management Research Study. Without the help of yourself and others, the study would not have been possible. Based on a preliminary review of the questionnaires received to date, many excellent contributions have been made.

Since there are some questionnaires outstanding, computer analysis of the data will not begin until August 4 (if you have been unable to complete the questionnaire, please do so now; every one is important). A summary of the results will then be available by mid-September.

Again, thank you for your cooperation.

Andrew J. Schou

# APPENDIX L

## Questionnaire Data Element Coding

No.	Item	Code	Card Column
0	Respondent Number	1-103	3-4
1	Management Level: Middle	2	1
	Flexibility, Problems 1-4		5-8
2	Style A	1	
3	Style B	2	
4	Style C	3	
5	Style D	4	
	Leadership Style		
6	Pleasant	1-8	9
7	Friendly	1-8	10
8	Rejecting	1-8	11
9	Helpful	1-8	12
10	Enthusiasm	1-8	13
11	Tense	1-8	14
12	Distant	1-8	15
13	Cold	1-8	16
14	Cooperative	1-8	17
15	Supportive	1-8	18
16	Boring	1-8	19
17	Quarrelsome	1-8	20
18	Self-Assuring	1-8	21
19	Efficient	1-8	22
20	Gloomy	1-8	23
21	Open	1-8	24
	Leadership Satisfaction		
22	Asks Advice	0,1,3	25
23	Hard to Please	0,1,3	26
24	Impolite	0,1,3	27
25	Praise for Good Work	0,1,3	28
26	Tactful	0,1,3	29
27	Influential	0,1,3	30
28	Up-to-Date	0,1,3	31
29	Doesn't Supervise Enough	0,1,3	32
30	Quick Tempered	0,1,3	33
31	Tells Me Where I Stand	0,1,3	34
32	Annoying	0,1,3	35
33	Stubborn	0,1,3	36

No.	Item	Code	Card Column
34	Knows Job Well	0,1,3	37
35	Bad	0,1,3	38
36	Intelligent	0,1,3	39
37	Leaves Me on My Own	0,1,3	40
38	Lazy	0,1,3	41
39	Around When Needed	0,1,3	42
Performance Evaluation			
Hill's Instrument			
Criteria: Work objective, planning, use of resources, work completion, motivation and communication			
40	Criteria Rank	1-6	43
40	Rating	1-6	44
41	Criteria Rank	1-6	45
41	Rating	1-6	46
42	Criteria Rank	1-6	47
42	Rating	1-6	48
43	Criteria Rank	1-6	49
43	Rating	1-6	50
44	Criteria Rank	1-6	51
44	Rating	1-6	52
45	Criteria Rank	1-6	53
45	Rating	1-6	54
Air Force Instrument			
46	Job Capability	0-5	55
47	Planning Ability	0-5	56
48	Executive Management	0-5	57
49	Executive Judgment	0-5	58
50	Human Relations	0-5	59
51	Writing Ability	0-5	60
52	Speaking Ability	0-5	61
53	Job Accomplishment	0-5	62
54	Educational Achievement		63
	Grade School	1	
	Some High School	2	
	Graduated High School	3	
	Some College	4	
	Graduated College	5	
	Have Advanced Degree	6	
	Have Doctoral Degree	7	
	Technical/Vocational Graduate	8	

No.	Item	Code	Card Column
55	Age Group		64
	24 and younger	1	
	25-34	2	
	35-49	3	
	50-64	4	
	65 and older	5	
56	Type Group Manager		65
	Close Coordination	1	
	Job Independence	2	
	Negotiation-Reconciliation	3	



# APPENDIX M RESPONDENTS CODED QUESTIONNAIRE DATA

No.	Mgt. Lev.	STYLE FOR PROBLEM 1 2 3 4	LEADERSHIP STYLE		LEADERSHIP SATISFACTION				PERFORMANCE EVALUATION		BACKGROUND Ed. Age Work Lev. Grp. Grp.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
			IPC SCORES		JDI SCORES				PART I SCORES			PART II SCORES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1	2	3	4	2	5	5	4	2	5	5	4	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

NOTE: Code Number 9 means no answer.

## APPENDIX M—Continued

APPENDIX H—Continued																							
No.	STYLE FOR PROBLEM: Lev 1 2 3 4	LEADERSHIP STYLE				LEADERSHIP SATISFACTION				PERFORMANCE EVALUATION				BACKGROUND Ed. Age Work Lev. Grp. Grp.									
		LPC SCORES				JDI SCORES				PART I SCORES		PART II SCORES											
31	1	3	4	4	3	3	5	6	2	3	3	0	3	3	0	3	3	0	3	6	5	4	1
32	1	3	2	1	2	6	7	0	6	3	3	0	3	1	3	3	1	1	3	3	6	5	3
33	1	1	5	1	2	4	4	3	4	5	4	1	1	0	1	3	0	3	3	1	5	3	1
34	1	2	2	3	3	4	1	2	1	2	2	3	1	3	3	0	3	3	3	3	6	5	3
35	1	3	3	4	1	3	5	7	4	3	3	3	3	3	3	3	3	3	3	3	6	5	3
36	2	1	1	1	1	3	6	2	3	3	4	4	8	5	2	0	0	1	3	3	6	5	4
37	1	1	3	1	3	7	9	5	2	2	3	3	4	8	2	7	4	0	3	3	6	5	4
38	2	1	2	4	2	2	4	2	6	6	2	3	1	4	2	1	4	3	3	3	6	5	4
39	1	2	2	2	4	8	4	5	4	8	6	4	5	8	6	3	3	3	3	3	6	4	2
40	1	3	4	2	2	5	6	3	1	4	4	3	8	1	4	3	2	2	3	3	6	4	1
41	1	1	3	3	3	9	9	9	8	9	9	9	1	9	9	9	9	9	9	9	6	4	1
42	1	2	2	1	6	6	3	3	7	5	4	4	1	2	7	1	7	6	7	3	6	6	3
43	2	4	3	3	7	7	6	6	1	5	5	2	2	6	5	3	3	3	3	3	6	4	1
44	1	2	1	3	1	4	4	1	1	2	1	1	1	1	1	4	8	1	7	1	6	4	1
45	1	1	3	1	3	6	6	1	1	2	1	1	2	4	4	6	8	2	5	1	3	4	2
46	2	1	4	1	3	2	9	2	5	5	6	6	5	4	5	5	3	3	3	3	6	3	2
47	1	3	2	3	2	6	7	6	6	6	6	6	6	7	7	7	6	6	6	6	3	4	1
48	1	2	4	4	3	2	4	2	1	4	1	2	1	1	4	1	9	1	1	1	6	7	4
49	1	2	3	4	1	6	6	4	3	2	4	4	2	1	2	4	4	3	3	3	6	3	1
50	1	3	4	4	3	6	7	4	3	2	6	3	4	3	2	5	1	3	3	3	6	3	2
51	1	1	1	1	1	2	5	2	5	1	1	1	5	8	1	8	5	1	4	3	4	4	2
52	1	2	4	2	4	5	3	6	5	2	3	6	2	2	1	7	5	2	6	3	5	3	1
53	1	2	3	2	1	3	3	2	1	1	3	3	1	1	2	1	7	2	3	2	6	3	2
54	1	2	3	2	3	5	4	5	2	1	5	3	3	3	3	4	7	5	3	1	6	3	1
55	1	3	2	4	2	1	3	4	1	2	2	2	3	1	3	2	1	3	3	3	4	9	1
56	1	2	1	2	1	5	5	3	4	4	4	3	4	5	4	5	5	3	3	3	4	3	1
57	1	4	4	4	6	7	5	1	1	7	5	2	5	6	2	1	7	6	3	3	5	4	3
58	2	3	4	1	5	4	1	8	3	4	4	1	4	6	2	5	7	2	3	3	6	3	1
59	1	1	1	1	1	7	6	2	6	2	1	5	6	6	5	7	3	7	1	0	6	3	1
60	1	1	4	4	4	4	7	7	7	3	1	1	5	1	2	5	8	3	5	1	4	2	3
61	1	2	4	2	7	5	5	2	5	7	4	5	5	4	5	5	6	5	3	3	4	6	3
62	1	1	1	1	1	6	7	4	1	3	4	1	1	3	3	1	6	1	1	1	6	3	9
63	2	2	3	1	2	7	6	6	2	6	6	6	7	2	7	3	6	5	3	3	5	4	1





## APPENDIX N—Continued

No.	Mgt. Lev.	STYLE FOR PROBLEM: 1 2 3 4	LEADERSHIP STYLE		LEADERSHIP SATISFACTION		PERFORMANCE EVALUATION		Ed. Lev.	Age Grp.	Work Grp.		
			IPC SCORES		JDI SCORES		PART I SCORES					PART II SCORES	
			1	2	1	2	1	2				1	2
97	1	1 2 1	4 4 1 1 1 8 4 5 1 3 1 4 5 2 6 2	3 3 3 3 3 0 0 0 3 3 3 3 3 3 3 3	3 3 3 3 3 0 0 0 3 3 3 3 3 3 3 3	64 54 45 36 25 15	3 3 4 4 4 4 4 4	5 4 4 1					
98	2	2 2 1 2	7 7 1 2 2 2 2 2 3 2 8 2 4 1	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	65 55 45 35 25 15	4 4 4 4 4 4 3 3	6 4 4 9					
99	1	5 5 5 5	5 4 3 2 4 1 5 5 5 5 1 1 8 1 1 4	0 3 3 3 1 0 0 0 0 1 1 0 1 1 3 1 3	0 3 3 3 1 0 0 0 0 1 1 0 1 1 3 1 3	63 53 43 34 24 15	3 2 2 3 3 2 2 3	6 3 1 1					
100	1	2 3 1 2	6 5 5 2 2 2 5 3 2 2 6 2 2 4 6 1	1 3 3 3 1 0 0 1 0 3 1 3 3 1 3 3 3	1 3 3 3 1 0 0 1 0 3 1 3 3 1 3 3 3	64 55 46 35 24 15	3 3 3 3 3 4 4 4	4 4 4 1					
101	2	4 1 2 3	5 4 2 3 5 6 2 2 4 5 7 5 8 5 5 2	3 0 3 1 0 3 1 3 3 1 3 3 3 3 3 3 3	3 0 3 1 0 3 1 3 3 1 3 3 3 3 3 3 3	63 53 43 33 23 13	3 2 2 2 3 3 3 3	6 4 4 1					
102	1	4 3 4 4	4 3 5 2 5 7 3 3 4 4 3 7 3 4 2	3 3 3 1 3 0 0 0 0 3 3 3 3 3 3 3 1	3 3 3 1 3 0 0 0 0 3 3 3 3 3 3 3 1	63 53 44 34 25 15	4 2 3 3 4 3 3 3	4 4 3 1					
103	1	3 3 4 4	5 5 6 1 5 8 4 5 5 5 2 5 2 4 4 4	3 3 3 0 3 0 0 0 3 3 3 3 3 3 3 3 0	3 3 3 0 3 0 0 0 3 3 3 3 3 3 3 3 0	65 55 46 35 25 16	5 6 5 5 5 4 5 5	4 4 4 1					
104	1	3 3 3 4	6 4 3 2 1 7 2 2 1 3 3 4 2 1 5 2	3 3 3 0 3 0 0 0 3 3 3 3 3 3 3 3 3	3 3 3 0 3 0 0 0 3 3 3 3 3 3 3 3 3	63 53 43 34 24 15	3 3 2 3 3 3 3 3	4 4 3 3					
105	1	2 3 1 2	4 4 2 2 3 4 1 1 2 5 4 4 2 2 5 2	0 3 1 0 1 3 3 1 3 3 3 3 3 3 3 3 3	0 3 1 0 1 3 3 1 3 3 3 3 3 3 3 3 3	62 53 42 32 23 13	2 1 2 1 3 1 1 2	4 4 3 1					
106	1	2 3 2 1	5 5 5 5 3 4 3 3 4 6 3 4 4 4 4	3 3 1 0 1 3 3 1 3 3 3 3 3 3 3 3 3	3 3 1 0 1 3 3 1 3 3 3 3 3 3 3 3 3	64 54 44 35 24 15	4 3 4 3 3 4 4 4	5 5 3 2					
107	1	2 3 3 1	5 5 6 4 5 3 4 3 4 5 4 3 3 2 4 5	3 0 0 0 0 3 3 1 0 3 0 0 3 3 3 3 3	3 0 0 0 0 3 3 1 0 3 0 0 3 3 3 3 3	61 51 42 32 22 13	3 1 2 1 3 2 2 2	6 6 3 2					
108	2	2 1 2 1	7 7 3 7 7 4 3 6 6 4 3 4 3 5 4	3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3	66 54 43 34 24 14	3 3 4 4 3 4 4 4	5 5 3 1					
109	1	1 1 1 1	2 3 3 3 5 5 2 2 3 3 3 6 6 1 2	0 0 0 3 0 1 1 0 3 0 0 1 1 3 3 3 3	0 0 0 3 0 1 1 0 3 0 0 1 1 3 3 3 3	63 52 43 32 23 13	3 2 2 2 2 2 4 3	3 3 3 9					
110	1	1 1 1 1	4 5 5 6 5 2 5 5 5 6 5 6 4 6 4 4	3 0 0 0 3 3 1 0 0 0 3 3 3 3 3 3 3	3 0 0 0 3 3 1 0 0 0 3 3 3 3 3 3 3	65 53 43 34 25 15	3 3 4 3 4 4 4 4	6 6 4 2					
111	2	1 1 2 1	2 2 3 1 7 1 4 3 2 1 2 1 7 2 5 1	0 0 1 3 1 1 1 3 3 3 1 0 3 3 3 3 3	0 0 1 3 1 1 1 3 3 3 1 0 3 3 3 3 3	66 56 45 36 25 14	5 5 4 4 5 4 4 5	4 4 2 2					
112	1	2 2 2 2	8 8 5 1 8 1 5 3 4 5 2 4 8 1 8 4	3 0 3 3 0 3 3 3 3 3 3 3 3 3 3 3 3	3 0 3 3 0 3 3 3 3 3 3 3 3 3 3 3 3	63 53 43 32 23 13	5 3 5 4 5 3 3 3	4 4 2 1					
113	1	4 4 4 4	7 7 4 2 7 2 5 7 7 2 5 7 2 2 7	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64 54 44 33 22 13	3 3 2 3 3 3 3 3	4 4 3 9					
114	1	2 2 2 2	3 3 1 1 7 3 3 1 1 6 2 2 1 3 2	3 1 3 3 0 3 0 3 3 3 3 3 3 3 3 3 3	3 1 3 3 0 3 0 3 3 3 3 3 3 3 3 3 3	66 55 45 35 24 14	4 3 3 3 4 5 5 4	4 4 4 1					
115	2	1 3 2 2	3 6 4 6 8 2 4 4 7 7 5 5 8 8 7 2	3 0 0 1 0 0 1 3 3 1 0 3 0 0 3 1 3 3	3 0 0 1 0 0 1 3 3 1 0 3 0 0 3 1 3 3	63 51 43 31 23 13	2 2 2 2 2 2 3 1	4 4 4 1					
116	2	2 1 1 1	5 5 3 1 3 6 2 2 5 4 6 1 2 5 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	65 56 45 34 24 16	3 3 2 4 4 0 4 3	6 6 3 1					
117	1	3 3 2 2	4 4 4 3 6 2 3 3 3 4 3 7 6 5 2	3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3	63 54 43 33 23 13	3 2 2 2 3 3 3 3	4 4 3 1					
118	1	2 2 1 1	1 2 5 1 8 2 1 2 4 4 1 2 8 6 2 2	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64 53 43 34 23 13	3 3 2 3 3 3 3 3	4 4 3 1					
119	1	2 3 4 2	6 7 1 6 1 2 1 2 6 2 7 5 6 8 8 1	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	65 55 45 35 24 14	4 4 3 3 3 4 4 4	4 4 3 2					
120	2	1 2 3 2	3 6 4 2 5 4 2 3 4 1 3 6 4 5 2	0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64 54 45 34 25 15	2 4 4 3 4 4 4 3	5 5 4 2					
121	2	3 4 4 3	5 5 4 3 7 5 2 4 5 4 3 4 7 6 3 2	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64 54 44 34 24 14	2 2 2 3 3 3 3 3	5 5 3 2					
122	1	2 4 4 4	5 7 2 3 3 7 2 5 2 3 5 4 4 2 4 2	3 3 3 0 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 0 3 3 3 3 3 3 3 3 3 3 3 3 3	65 55 45 35 24 15	3 3 3 3 4 4 4 3	5 5 3 2					
123	1	2 4 3 3	3 3 2 2 5 1 2 2 4 2 4 1 6 6 3 1	0 3 0 0 3 3 3 3 3 3 3 3 3 3 3 3 3	0 3 0 0 3 3 3 3 3 3 3 3 3 3 3 3 3	65 55 46 36 25 15	5 4 4 3 4 4 5 5	7 7 3 1					
124	1	1 1 1 1	7 8 8 2 3 8 4 6 6 6 8 1 1 8 8	0 1 3 0 0 0 1 0 3 0 0 3 3 3 3 3 3	0 1 3 0 0 0 1 0 3 0 0 3 3 3 3 3 3	65 55 45 35 25 16	3 3 3 3 4 0 0 3	5 5 3 2					
125	2	1 3 1 3	4 4 2 1 3 3 1 1 3 3 2 2 8 1 4 2	0 3 3 0 0 0 0 3 3 3 3 3 3 3 3 3 1	0 3 3 0 0 0 0 3 3 3 3 3 3 3 3 3 1	65 53 45 35 25 16	5 4 4 4 3 3 4	6 6 3 2					
126	1	1 1 1 1	4 7 7 1 7 1 4 5 7 5 5 7 4 5 4	3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	61 52 43 35 23 11	2 2 2 4 3 5 5 2	5 5 3 2					
127	1	3 3 4 4	1 2 2 3 3 3 3 4 2 3 4 3 4 1 4 6	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64 54 45 36 25 15	4 4 4 4 3 3 4	6 6 3 2					
128	1	3 3 3 3	3 3 5 1 8 8 8 7 1 1 7 7 1 1 8 1	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	63 52 44 32 23 14	3 2 2 2 2 2 1 0	4 4 4 3					
129	2	2 3 2 4	2 3 1 5 2 1 5 2 2 2 1 4 3 1 1 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	65 55 45 36 26 16	4 4 4 4 5 4 4 4	6 6 4 2					



## APPENDIX N

### Statistical Tests Employed

#### The One-Sample Test

This technique was employed to test hypotheses which called for drawing just one sample.<sup>1</sup> The chi-square test was used to test whether a significant difference existed between an observed number of responses falling in each category and an expected number based on the null hypothesis. The null hypothesis stated the proportion of responses falling in each of the categories in the presumed population. The null hypothesis was tested by:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

where  $O_i$  = observed number of cases categorized in  $i$ th category;  
and  $E_i$  = expected number of cases in  $i$ th category under  $H_0$ .

The value of chi-square for testing Hypothesis One was calculated as illustrated below:

$$\begin{aligned}\chi^2 &= \frac{(28-25.8)^2}{25.8} + \frac{(21-25.8)^2}{25.8} + \frac{(29-25.8)^2}{25.8} + \frac{(44-25.8)^2}{25.8} + \frac{(2-25.8)^2}{25.8} \\ &= 0.188 + 0.002 + 0.397 + 12.839 + 21.96 \\ &\quad + 35.386\end{aligned}$$

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<sup>1</sup>Siegal, Nonparametric Statistics, p. 43.

### Test for Two or More Independent Samples

This technique was employed to test hypotheses stating that the groups differ with respect to some characteristic and therefore with respect to the relative frequency with which group members fall in several categories.<sup>1</sup> To test these hypotheses the number of cases in each group which fall in the various categories were counted; and the proportion of cases from one group were compared with the proportion of cases from the other group. The null hypothesis was tested by:

$$\chi^2 = \sum_{i=1} \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where  $O_{ij}$  = observed number of cases categorized in  $i$ th row of  $j$ th column.

and  $E_{ij}$  = number of cases expected under  $H_0$  to be categorized in  $i$ th row of  $j$ th column.

The value of chi-square for testing Hypothesis Two was calculated as illustrated below:

<u>23.04</u>		<u>21.96</u>	
28	17	45	
<u>26.11</u>		<u>24.89</u>	
26	25	51	
<u>32.25</u>		<u>30.75</u>	
29	34	63	
<u>44.53</u>		<u>42.46</u>	
44	43	87	
<u>3.07</u>		<u>2.93</u>	
2	4	6	
129	123	252	

<sup>1</sup>Ibid., pp. 43, 104.

$$\begin{aligned}
\chi^2 &= \frac{(28-23.04)^2}{23.04} + \frac{(17-21.29)^2}{21.29} + \frac{(26-26.11)^2}{26.11} + \frac{(25-24.89)^2}{24.89} \\
&+ \frac{(29-32.25)^2}{32.25} + \frac{(34-30.75)^2}{30.75} + \frac{(44-44.53)^2}{44.53} + \frac{(43-42.46)^2}{42.46} \\
&+ \frac{(2-3.07)^2}{3.07} + \frac{(4-2.93)^2}{2.93} \\
&= 1.07 + 1.12 + 0.0005 + 0.00002 + 0.328 + 0.343 \\
&+ 0.006 + 0.007 + 0.373 + 0.391 + 3.378 \\
&= 3.6385
\end{aligned}$$

#### The Contingency Coefficient

The Contingency Coefficient C was used to measure the extent of association between leadership style-flexibility groups and leadership style.<sup>1</sup> The observed frequencies were entered in a contingency table so as to permit calculation of the value of chi-square for the data observed. This value of chi-square was used to determine the value of the contingency coefficient using the following:

$$C = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

A determination as to whether the association found between the two sets of scores indicates that an association exists in the population was made by testing the association for significance. This involved testing the null hypothesis that there is no correlation in the population, i.e., that the observed value of the measure of association could have arisen by chance. The test of whether the observed C differs

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<sup>1</sup>Ibid., pp. 198-200.

significantly from chance involved determining whether the  $\chi^2$  for the data was significant.

Spearman Rank Correlation Coefficient:  $r_s$

The Spearman Rank Correlation Coefficient ( $r_s$ ) was used to measure the extent of association between the leadership performance scores obtained on each of the two instruments used in the questionnaire.<sup>1</sup> To compute  $r_s$  it was necessary to make a list of all the respondents and then enter the rank for the respondents score for the first instrument and then the second instrument. It was then necessary to determine the values of  $d_i$ , that is, the difference between the two ranks. This procedure is illustrated below:

<u>Respondent</u>	<u>Score</u>		<u>Rank</u>		<u><math>d_i</math></u>	<u><math>d_i^2</math></u>
	<u>First Instrument</u>	<u>Second Instrument</u>	<u>First Instrument</u>	<u>Second Instrument</u>		
25	88	31	2	1	1	1
30	73	15	3	3	0	0
35	97	30	1	2	-1	1

From the data so arranged the value of  $r_s$  was computed using the following formula:

$$r_s = 1 - \frac{\sum_{i=1}^N d_i^2}{N^3 - N}$$

$$= 1 - \frac{6(1)}{(3)^3 - 3}$$

$$r_s = 0.75$$

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<sup>1</sup>Ibid., pp. 202-212.



The significance of  $r_s$  was tested using the null hypothesis that two sets of scores were not associated in the population and that the observed value of  $r_s$  differs from zero only by chance. The probability under  $H_0$  of any value as large as the observed value of  $r_s$  was determined by computing the  $t$  (student's  $t$ ) associated with the value of  $r_s$  using the following formula and determining the significance of the value of  $t$  by reference to a table.

$$t = r_s \sqrt{\frac{N-2}{1-r_s^2}} \quad (\text{when } N \geq 10)$$

#### The Level of Significance

The procedure employed was to reject  $H_0$  in favor of  $H_a$  if a statistical test yielded a value whose associated probability of occurrence under  $H_0$  was equal to or less than some small probability ( $\alpha$ ), called the level of significance.

Common values of  $\alpha$  are 0.05 and 0.01. The question of which significance level should be said to be significant is difficult because the value of  $\alpha$  enters into the determination of whether  $H_0$  is or is not rejected. The significance level of  $\alpha = 0.05$  was chosen for the following reasons.

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<sup>1</sup>The procedure of adhering rigidly to an arbitrary level of significance, e.g., 0.05 or 0.01, is rejected by some according to Fred N. Kerlinger in Foundations of Behavioral Research, p. 154. He reports a newer trend of thinking that "advocates reporting the significance level of all results." For example, if a result is significant at the 0.12 level, it should be reported accordingly. He reports that others advocate that "one should make a bet and stick to it" (the procedure used in this study).

1. The requirement of objectivity demanded that  $\alpha$  be set in advance of the collection of the data.

2. The level at which  $\alpha$  is set should be determined by an estimate of the importance or possible practical significance of the findings. In this case the level of  $\alpha = 0.05$  had been chosen by Hill as part of the research replicated in the current study.

3. It has been conventional in social sciences to say that, if the probability that something happens by chance is less than five per cent, it is significant.<sup>1</sup>

4. While choice of a level of statistical significance is to some extent arbitrary, it is not completely so, e.g., the 0.05 and 0.01 levels correspond fairly well with two and three standard deviations from the mean of a normal distribution.<sup>2</sup>

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<sup>1</sup>Julian L. Simon, Basic Research Methods in Social Sciences (Random House, New York, 1969), p. 383.

<sup>2</sup>Kerlinger, Foundations of Behavioral Research, p. 154. He also observes that the 0.05 level was apparently first chosen by Fisher as indicated in R. Fisher, Statistical Methods for Research Writers (New York: Hafner, 1950), p. 80.

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